Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

B69P

Poultry Secrets

Published by
THE FARM JOURNAL
PHILADELPHIA

POULTRY SECRETS

GATHERED, TESTED AND NOW DISCLOSED

BY

MICHAEL K. BOYER

(Poultry Editor, Farm Journal)

PHILADELPHIA—1914

WILMER ATKINSON CO.

Price, 25 cents

Transferred from the Library
of Congress under Sec. 59,
Copyright Act of Mch. 4, 1909

Copyright, 1908
Copyright, 1909
Copyright, 1910
Copyright, 1914

WILMER ATKINSON CO.

Sixteenth Edition
One Hundred and Twentieth Thousand

NOV -4 1914
©CLA386955

136134

Publishers' Foreword

This work has been prepared by Michael K. Boyer, one of the foremost poultrymen of the United States. In its preparation he has drawn on his own great storehouse of experience, and on those of his many friends who are authorities on poultry. It is packed full of information not generally known to the average poultryman.

Permit us to say, however, that these "secrets"—like the majority of human secrets!—are probably not secrets to every person. Some people have had things whispered in their ear or have read occasional hints in papers, or perhaps they have paid five or ten dollars to some expert who furnished the information, or possibly they have bought some expensive book that contained one or two little-known facts. And so this so-called secret knowledge has spread, gradually and slowly, among a—so to speak—"select inner circle" of poultrymen who treasure it more or less carefully. Of course some of the secrets, like different kinds of molasses, have "leaked" faster than others, and therefore have become better known.

We do not believe that there is a single secret in this book which is not known to at least a few breeders of poultry. Nor do we assert that none of these secrets have ever before been put into print. But we say this: Some poultrymen have paid considerable money to learn only a few of these secrets; many poultrymen have lost money because they did *not* learn; and every poultryman now has the first chance ever offered, we think, to obtain in one book a summary of the most important of the secret knowledge, old or new, that exists to-day. This summary is as complete as money and experience can make it, and as fast as newer processes or methods are discovered we shall secure them promptly.

To sum up, we feel that this book should put money into the pockets of thousands of poultry keepers—men and women—who have not before had access to the partially-concealed knowledge which a few insiders have hitherto tried to monopolize.

WILMER ATKINSON CO.

INV. '60

CONTENTS

PAGE

SECRETS OF FOWL BREEDING 7
Burnham's Secret of Breeding 7
Felch's Secret of Mating 8
Mendel's Secret of Heredity 9
Secret of Alternating Males for Fertility 11
Secret of the Philo System 13
Curtiss' Secret of Hatching More Pullets Than Cockerels 14
Davis' Secret of Raising Every Chick 14
Babcock's Secret of Developing the Spike on a Rose Combed Fowl 15

SECRETS OF FEEDING 17
Secret of Feeding Grains 18
Dr. Woods' Laying-Food Secret 19
Feeding Linseed Meal 20
Feeding Meat and Salt 21
Feeding Charcoal, Grit and Oyster Shells 22
Secret of Green Feed 22
Secret of Feed at Fifteen Cents per Bushel 22
Sprouted Barley Secret 24
Smith's Secret of Preserving Vegetation in Poultry Runs 24
Important Feeding Secret 25
Miscellaneous Feed Pointers 25
Chick Feed Secrets 26
Seely's Secret of Dry Bran Feeding 27
Gowell's Fattening Secret 27
Gray's Fattening Secret 28
Greiner's Corn Feeding Secrets 28
McGrew's Secret of Feeding During Molting 29

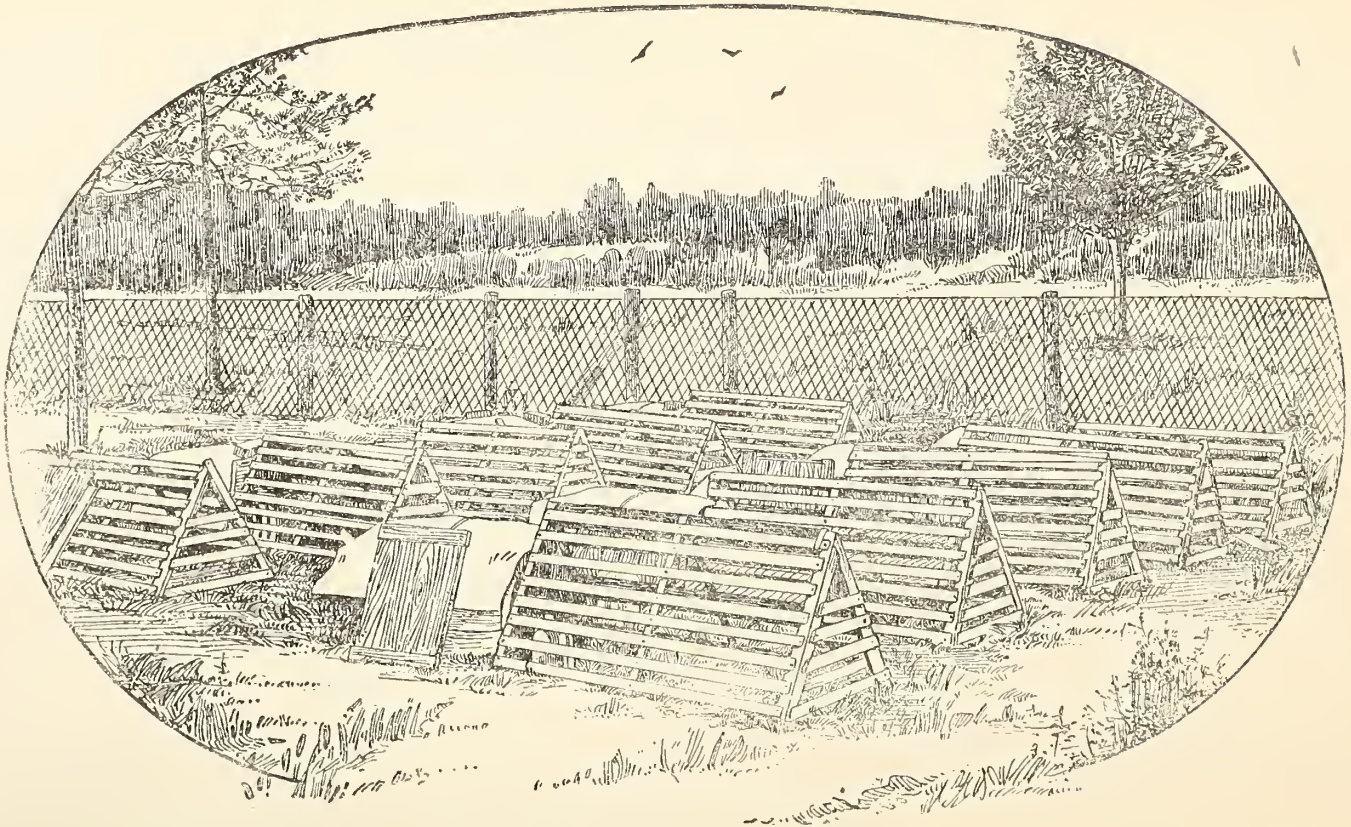
SECRETS OF HOUSING AND CARE 31
Secret of Successful Yarding 34
Secret of Telling the Laying Hen 35
Secret of 200 Eggs per Hen per Year 36
Lawby's Secret of Insect Killers 36
Secret of Successful Molting 37
Zimmers' Secret of Securing Foster Mothers 37
John Robinson's Secret 38
Secret of Chicks Dying in Shell 38
Secret of Scaly-Leg Cure 39
Secret of How to Hold a Fowl 39
Blanchard's Secret of Stopping Cocks from Crowing at Night 39

PAGE

EGG SECRETS 40
Brown's Secret of Preserving Eggs 40
Secret of Killing the Fertility of Eggs 40
Secret of Obtaining Winter Eggs 40
Brigham's Secret of Sterility and Fertility of Eggs 41
Morgan's Secret of Winter Layers 43
Secret of the Angell System 43
Secret of Eggs All the Year 44
Secret of Having Perfect Eggs 45
Kohr's Secret of Selecting Layers 45
Kulp's Secret of Producing Great Layers 46
Professor Rice's Fat Hen Secret 46
Crane's Secret of Holding Eggs for Hatching 48
Boswell's Secret of Testing Eggs 49
Dr. Woods' Egg Hatching Secret 49

MARKET SECRETS 51
Judging the Age of Dressed Poultry 51
Secret of Dressing Fowls 52
Secret of Celery-Fed Broilers 52
Secret of High-Priced Stock 52
Truslow's Secret of High Prices for Ducks 53

SECRETS OF EXHIBITING 55
Drevenstedt's Secret of Exhibition Fowls 55
Heimlich's Secret of Exhibition Fowls 59
Zimmer's Secret of Line Breeding 60
Rigg's Secret of Uniform Markings 61
Marshall's Secret of Training Show Birds 61
Lambert's Secret of Growing Good Tails 62
Heck's Secret of Adding Exhibition Weight 63
Fishel's Secret of Preparing Fowls for Early Fall Shows 64



NATURE'S BEST INCUBATOR

Outdoor barrel nests for sitting hens. About 3 inches of earth is excavated in which the barrel is laid on its side; waterproof paper placed over top. For a run 4-foot lath is used, made A-shaped. At night a board is placed in front of nest to keep out rats, cats, etc. The nest is made of a layer of earth, with straw on top.

Secrets of Fowl Breeding

Burnham's Secret of Breeding

As a rule, a two-year-old male with twelve-month-old females, will give the best results. The cock bird should possess in full vigor such qualities as will reproduce his superior form and stamina.

In selecting hens, pick out the good layers, of generous size, stout constitution and good form. A one-year-old cock on two-year-old hens is another successful mating.

Generally, one male with eight or ten hens is the best mating; but, in case of alternating males in the pens, as many as fourteen females will give equally as good results. Deformed or over-fat females should never be used, as these deformities will probably be transmitted to the offspring.

The weights as given by the American Standard of Perfection are exhibition weights, and are about a pound heavier than is advisable for breeding purposes. Never use a male that equals or exceeds the Standard weight.

Males that are too greedy, or those that are so gallant that they will not eat until the hens have helped themselves, are likewise of little value in the breeding pen, as they will become overfed in the former case, and underfed in the latter.

Some poultrymen, after the breeding season, allow the different varieties to run together on a common range, and then remate when the hatching season again comes around. This is a serious mistake and spoils the guarantee of absolute purity. When a fowl or animal of any fixed breed has once been pregnant to another of a different variety and color, that fowl or animal is forever afterward crossed; and the original purity of the blood is lost.

It may perhaps be appropriately stated here, that the most successful result in uniformity of production is realized in breeding from one strain or line of ancestry direct. A prime, vigorous cock being selected (one possessing all or a majority of the fine qualities we seek to perpetuate), and this male being bred to a few hens of the same type and the best of their kind, will give us in the first progeny uniformly good chickens.

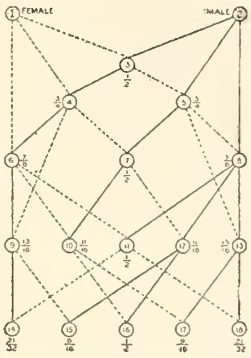
The pullets among this product, if bred back to the old cock, will also give us a majority of good chickens. The hens only, for a couple of years, should be bred to the original cock, or a cock

in the third remove from him. (The cocks of the first result cannot be used advantageously with any of these hens or pullets.)

Then, if more hens are wanted, fresh female blood should be introduced; and one or two of the best cocks from this last union may be bred back with the second hens (at two years old) to advantage. *This plan avoids in-and-in breeding.* Only the best birds should be selected and mated, avoiding as much as possible the breeding together of cockerels and pullets of the same age, or those which come from eggs laid by the same hen.

Felch's Secret of Mating

Isaac K. Felch originated this remarkable breeding chart, which he termed "Arithmetic in Poultry Culture," by which method he produced thousands of chickens and three strains of blood from a single pair, in the vigor, size and color of the original pair. This carefully-treasured secret is very valuable: The illustration shows solid and dotted lines, the former representing the male, the latter the female. Each circle represents the progeny.



FELCH'S BREEDING CHART

In explanation: Female No. 1 mated to male No. 2 will produce group No. 3, which is half the blood of the sire, and half that of the dam. Females from group No. 3, mated back to their own sire (No. 2), produce No. 5, which is three-fourths of the blood of the sire (No. 2) and one-fourth the blood of the dam (No. 1).

A male from group No. 3, mated back to his own dam (No. 1), produces group No. 4, which is three-fourths of the blood of the dam (No. 1) and one-fourth the blood of the sire (No. 2).

Again, select a cockerel from group No. 5, and a pullet from group No. 4, or vice versa, which will produce group No. 7, which is mathematically half the blood of each of the original pair, Nos. 1 and 2. This is a second step toward producing a new strain.

Females from No. 8 mated back to the original male (No. 2) produce a group that are seven-eighths the blood of No. 2, and a cockerel from No. 4, mated back to the original dam (No. 1) produces group No. 6, which is seven-eighths the blood of the original dam and only one-eighth the blood of the original sire.

Again, select a male from No. 8 and females from No. 6, and for a third time produce chicks (in group No. 11) that are half the blood of the original pair. This is the third step and the ninth

mating in securing complete breeding of the new strain. In all this, the line of sires has not been broken, for every one has come from a group in which the preponderance of blood was that of the original sire. Nos. 2, 8, 13 and 18 are virtually the blood of No. 2.

The point is now reached where can be established a male line whose blood is virtually that of the original dam. If now a male is selected from No. 6 and mated with a female from No. 4, group No. 9 will be produced, which is 13-16ths the blood of the original dam (No. 1) and 3-16ths the blood of the original sire (No. 2).

Again select a male from No. 9, and a female of the new strain (No. 11) and produce group No. 14, which becomes 21-32ds of the blood of the original dam, thus preserving her strain of blood.

A male from No. 13, which is 13-16ths the blood of the original sire (No. 2), mated to females from No. 10, which are 5-16ths the blood of the original sire (No. 2) gives group No. 17, which is 9-16ths the blood of said sire.

Mr. Felch says: "While in No. 16 we have the new strain, and in No. 18 the strain of our original sire (No. 2), we have three distinct strains, and by and with this systematic use we can go on breeding for all time to come." Remember that each dotted line is a female selection, and each solid line the male selection.

Mendel's Secret of Heredity

Gregor Mendel, after much study and research, discovered that heredity was no mystery, but instead a natural phenomenon, subject to attack by the scientific method of observation and experiment.

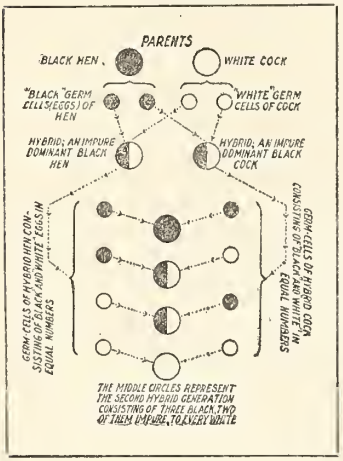
Mendel experimented first with the vegetable kingdom, and his hybridization trials and tests became the basis for a new and important hereditary idea which promises to revolutionize the breeding of plants, poultry and animals. While his early experiments were with plants, the same principle also holds good with animals.

According to Mendel's theory we can take fowls—say the Wyandottes—taking two distinct colors, the white and the black. We cross them; and, as a result, instead of being of an intermediate color, we find the offspring are all black, like the black parent. This proves that black is dominant to white, the latter being recessive.

Now, if we breed together the hybrid blacks, we shall have blacks and whites in the proportion of three of the former to one of the latter. The white so formed will breed true after that, and throw no blacks, notwithstanding their black ancestry.

Mendel tells us that there are two classes of blacks. The one might be termed pure dominants, which throw only blacks when mated with a white bird, and the other is classed as impure dominants which give results like the original hybrids when mated together, giving blacks and whites in the ratio of three to one. Such birds, crossed with whites, produce equal numbers of black and white.

The formation of a new individual, Mendel explains, is the result of the union of two germ-cells, of which one is provided by each parent, the spermatozoon or pollen given by the male, and the ovum or egg cell by the female.



Going back to the crossing of the black and white Wyandotte, we have the inheritance of two alternative characters—black and white. The main idea is that any given germ-cell can contain only one of these alternative characters. Then, in the present instance every germ-cell must carry either black or white, but not both.

In other words, when a "black" germ meets another "black" germ, there will be a pure dominant black chicken, which itself can produce only black germs; when a "white" germ meets a "white" germ, a white chicken results, which can give rise to "white" germs only. Likewise, when a "black" germ meets a "white" germ, the resulting bird is in appearance a black, for the reason that blackness is dominant over whiteness. But when such a bird comes to form germ-cells, says Mendel, the black and the white characters separate from one another and pass singly into the germ-cells.

Therefore, a bird which has been formed by the union of a "black" and a "white" germ-cell does not form "gray" germ-cells, but forms equal numbers of "black" and "white" germ-cells. The breeding together of the hybrids, therefore, means the coming together of two sets of germ-cells, each consisting of equal numbers of blacks and whites. There can be only one result coming from this—the creating of a number of offspring, of which one-quarter are formed by the union of two "black" germ-cells, one-quarter by union of two "white" germ-cells, and two-quarters by the union of a black and white. Like the original hybrids, these last will be black to the eye, for the reason that blackness is dominant to whiteness where both exist in the same individual.

Now, going to a further generation, we find that if the whites

are bred together they will breed true, notwithstanding that both of their ancestors were black. There can be no blacks, as the black character has been split clean out of the germ-cells from which they arose.

There are two classes of the blacks, of which one is twice as numerous as the other. There are the hybrid blacks formed by the union of a " white " and a " black " germ-cell, and when bred together they act like the original hybrids in that a quarter of their offspring are whites. The other class of blacks consists of those formed by the union of two black germ-cells. These breed as true to blackness as the original pure black grandparent. It is here that the great practical importance of Mendel's discovery lies. When a cross is made between two pure strains which differ from one another in respect of a single pair of characters only, the second generation will contain a definite proportion of individuals which breed as true to the characters they exhibit as did the original parents.

Boyer's Secret of Alternating Males for Fertility

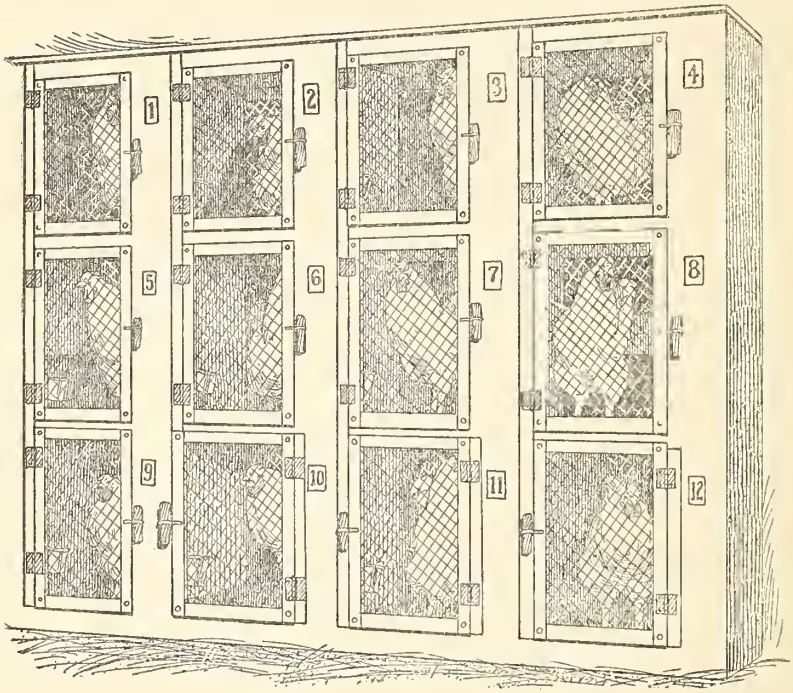
The writer breeds Wyandottes, Brahmas and Leghorns—covering the American, Asiatic and Mediterranean classes. In mating, fourteen females are quartered in each Wyandotte pen; ten in each Brahma pen; and twenty-four in each Leghorn pen. The male bird in each pen is changed each week. The plan adopted is as follows: Each house contains three pens, and four males (all brothers) are assigned to each house. The males go by Nos. 1, 2, 3 and 4 and the pens by Nos. 1, 2 and 3. In the start Cock No. 1 is placed in Pen No. 1; Cock No. 2 in Pen No. 2; Cock No. 3 in Pen No. 3; and Cock No. 4 in a cage in another building. At the end of the week, Cock No. 1 is taken to the aforesaid building and placed in a cage; Cock No. 2 takes his place in Pen No 1; Cock No. 3 goes into Pen No. 2; and Cock No. 4 goes into Pen No. 3. So on each week the changes are made in regular order. This gives each male bird the advantage of three weeks with the hens and one week of rest each month.

Where male birds are continually in the same pen, they grow sluggish, and besides will have their favorite hens, paying no attention to the others. On the other hand, hens have their likes and dislikes, and will fight off certain males, and welcome others. But where there is a weekly change of males, there is considerable less chance for favoritism, and the eggs not only give a higher percentage of fertility, but the chicks are stronger.

Some writers advise changing males each night. Aside from the labor this plan necessitates, I have found that it is detrimental to a good hatch. In the first place this constant changing

harasses the hens, besides in some males it means inattention, as they hardly have time to become acquainted with the females.

On the farm of the writer this changing of males is begun January 1st and kept up until June 1st. During June no changes are made, and on July 1st all the male birds are removed from the pens and placed in separate enclosures, where they remain until the following January. This gives both sexes a good chance to molt, and the eggs laid by the unmated hens will keep in a good condition twice as long as those that are fertilized. There used to be a belief that hens would not lay so well unmated as when mated, but this theory has been found to be incorrect. The presence of the male has no influence whatever on egg production. The mission of the male is to fertilize the eggs and right there his usefulness ends.



CAGES FOR BREEDING MALES

Each cage measures 2 x 2 feet, 2 feet high, with door made of one-inch wire netting.

The Secret of the Philo System

Wide-awake poultrymen may have noticed in many of the leading journals of the country an advertisement telling of a system capable of producing $200.00 in six months from twenty hens, and with other startling headlines. This is the advertising of the Philo System developed by E. W. Philo, a well-known poultryman of Elmira, N. Y.

The secret of the Philo system is to crowd much in little space and yet have the stock do well. The keynote to the Philo system, so far as there can be said to be a dominating note, is small numbers together. A few eggs together in the incubator (just as there are but a few under the hen), a few chicks together in a brooder, a few youngsters together in a colony coop, a few layers in a small house. The development of the system has brought about the adoption of this foundation principle, and upon this foundation the great success of the system is based.

Mr. Philo has found that the more frequently the eggs are turned in the incubator, the better the hatch, other conditions being right. He recommends to turn the eggs three times a day, instead of twice as is generally recommended, and he says there will be no cripples in consequence.

He broods the chicks, winter and summer alike, in the brooder without heat of any kind, the theory being that with the right device the natural heat of the chick is ample for all purposes.

The tiny houses, or " colony coops," in which Mr. Philo keeps six head of layers, are most interesting, and they fully illustrate the " small units " basis of the Philo system. They are but three feet wide each, by six feet long, and although but four feet high to the eaves (five feet to gable) they are two stories; the upper floor is the roosting-laying-feeding apartment; the ground floor is, literally, a " ground floor," and is the exercising room.

Mr. Philo doesn't feed green cut bone or beef scraps, believing he gets just as good an egg yield and more hatchable eggs without scraps, and says "you cannot get good, hatchable eggs when feeding green cut bone."

The eminent success of the system as a whole is shown on the little back-yard plant, where Mr. Philo now has the sixth generation of birds hatched, reared and kept by it, all on the tiniest plots of ground, and as sturdy-healthy birds as one can see anywhere. The summer coop covers thirty square feet of ground, and sixteen birds have a little less than two square feet of ground space each.

To get eggs when prices are high, the Philo System advocates changing the season for hatching, so that the hens will molt in the spring as naturally as they now do in the fall. This is done by each year using only the early-hatched cockerels and pullets for the breeders. It will take several years, however, before this

plan can meet with any degree of success. This advice calls for careful breeding, just as broodiness has been bred out, or rather more or less reduced in some breeds.

Philo claims that by proper selection and breeding it is possible to produce eggs that will show good fertility, and the chicks will be as strong if hatched in winter as in June. Now if the pullets are in condition to lay through the winter, they will molt during the spring, and will be in good condition to produce high-priced eggs during the fall and winter, just at a time when the spring-hatched pullets will be on a vacation.

The Philo System is particularly applicable to the small village and city poultry plant, and of less merit to the average farmer whose poultry ranges over many acres.

While the Philo System Book is well worth purchase and study, purchasers should not assume that they can equal at once the remarkable profits Mr. Philo has personally secured from his flock.

The Curtiss Secret of Hatching More Pullets Than Cockerels

W. R. Curtiss, who is the head of the largest poultry farm in Western New York (capacity 100,000 head annually), sends us the following valuable secret:

Everyone knows that in order to get what pullets they want, they must also hatch cockerels, as there is no known way of hatching all pullets. However, we are enabled to overcome this difficulty to a considerable extent by following these rules in mating up breeding pens: In the lighter breeds of the Mediterranean classes, we use one yearling cock bird of known reliability to from thirty to forty well-developed, vigorous pullets. With American breeds we use one yearling male of known reliability to from twenty to twenty-five well-developed, vigorous pullets. By giving these birds as large yards as possible, of unlimited range, if it can be had, we find that our hatches average from 60 to 75 per cent. pullets, and by this means we do not have to raise so many chicks to get the number of pullets we want, as we do if we use less females in our breeding pens. A trial of this method will convince the most skeptical.

Davis's Secret of Raising Every Chick

Howard L. Davis contributes this valuable information as the result of his long experience: The egg from which a chick is to come must be from strong, healthy, vigorous stock, properly fed and cared for, so that the egg contains all the elements and strength to produce a livable chick.

It must be properly incubated to produce a livable chick, which means that during its twenty-one days of incubation it must have exactly the proper degree of heat, not *about* the proper degree of heat. Too high a temperature is one of the main causes of diarrhœa in chicks. Too low a temperature, especially the first week, is the main cause of deformed chicks and cripples, and either too low or too high a temperature means chicks that will not live.

The egg chamber in which the egg is hatched must also contain exactly the proper degree of humidity. Not as some people say, to supply moisture to the egg, but to supply moisture to the air of the egg chamber, so that the exact amount of evaporation from the egg takes place. Moisture can in no way be supplied to an egg. Too much or too rapid evaporation means little, puny, weak chicks. Too little or too slow evaporation means chicks too large to free themselves, and dead in the shell.

The egg chamber must also be ventilated. Never from the bottom. No matter what kind of an incubator you are running, if it has an open bottom, or it has ventilators in the bottom, or any crevices in which the air can leak out through the bottom, far better results will always be obtained if they are entirely closed. Bottom ventilation means cripples and deformed chicks.

The chick, having been hatched *under the above conditions,* after exactly twenty-one days of incubation, should then be given comfortable sleeping quarters, never more than fifty together, not where there is any artificial heat, but where the heat from their own bodies will keep them comfortable, and where it is dark; and properly fed. Given such a condition, you are then able to produce the great secret, which will enable you to raise every chick *so hatched.*

Babcock's Secret of Developing the Spike on a Rose Combed Fowl

H. L. Babcock, one of the old-time poultry authorities, sends this valuable secret: In rose-combed varieties, it not infrequently happens that the spike is undeveloped. The end of the comb looks somewhat as a rubber ball does when a portion of its surface has been pushed in. This may be the case with the finest bird that a breeder possesses. Such a retained spike may be brought out and developed by manipulation. Take the comb between the thumb and forefinger and keep rubbing it back and forth. Continue the work until the inverted spike is pressed out into its proper position. This sometimes can be done in a few minutes; sometimes it may take considerable time and more than one operation. But if taken in time, the spike may be developed,

and the value of a fine specimen greatly enhanced. It is best to take such cases in hand as soon as discovered, but I have known the work to be done successfully while the bird was in the show room.

Such work is not faking. The spike is there, but for some reason it has not come out into its natural position.

Secrets of Feeding

There is more in the feed than in the breed. To secure the proper results you must give the right amount of food, of the right kind, at the right time. You must closely watch the appetites of the fowls so that you can properly cater to them. Just what would be right for one flock might be wrong for another.

Fowls in a wild state live on seeds, green stuff and bugs and worms. In the state of domestication these articles must be supplied in some form or other.

Just before it matures is about the most hungry period in a bird's life. It can eat more then than at any other time, and if it does not get all it can eat, more harm is done than can be repaired during the rest of its life.

If you will go to the trouble of examining the crops of the fowls at night while they are on the roost, it can be pretty well determined whether they are getting enough or not. If the crop is distended and hard, too much is being fed; if nearly empty, too little is given. The grain in the crop should fill it comfortably full, yet the skin ought not to be as tight as a drum, but rather loose and yielding. The healthy hen is a hearty eater.

The poultryman who studies the appetites of his flocks, and feeds accordingly, never fails in putting his feed to the best advantage. It is always well to have the fowls partially hungry. This will induce them to scratch in the hope of finding some more. Scratching is the best exercise hens can get.

To be continually changing the bill of fare rather hurts than benefits egg production. Have one system of feeding, but let that system contain as much variety as possible. Purity of food is important.

The hungry hen is seldom choice in the selection of her food. To feed properly conditions must be studied. The amount and quality of food that would keep a Wyandotte in good condition would likely overfatten a Plymouth Rock.

It is what a hen is able to digest and assimilate, and not what it eats, that makes both eggs and flesh. The principal requirement of a hen is a balanced ration and regular feeding. "A feast to-day and a famine to-morrow" will upset the best of layers. If the stock is doing well under the present system of feeding, it is a mistake to make a change in the bill of fare.

The plan adopted by the writer is to give a large iron spoonful of mash in the morning for every two fowls in the pen. The

spoonful means about as much as one would be able to pick up with the hand. At night, a full handful of mixed grains for every fowl in the pen is about all they can eat, and that amount will carry them over in comfort until the next morning. But when it is noticed that they do not readily clean up the allowance, the next day the amount should be cut down, and continued so until the appetite is again fully restored. Some fowls can exist, and be prolific, on almost half what would be needed for others. When this is noticed in a pen it is advisable to cut down their allowance to meet the demand.

Sudden changes in the bill of fare very often throw fowls off their appetite. I had a little experience in that line some time ago. A fellow poultryman purchased a lot of sweepings from the grain elevators. These sweepings contained wheat, corn, flaxseed, bran, middlings, etc. The fowls did not take kindly to the mixture, and the result was, there was a general decline in the egg crop. Just as soon as the old bill of fare was resumed, the egg yield increased, and gave a good record. While the articles contained in that mixture were substantial egg foods, they were not rightly balanced, and there was too much waste.

As a general thing, more fowls are overfed than underfed, especially where small flocks, or a limited number, are kept. While overfeeding has its bad effects, underfeeding is equally as bad. An underfed hen may receive sufficient food to sustain the body, but there is a lack of material for egg making. It should be known that the first food a fowl takes goes toward the building up of waste tissues, and the overplus to the making of eggs or fat, according to the quality of food given.

Feeding Grains

I have learned to study chemistry in feeding poultry. The carcass of a hen consists of fat, lean meat, and bone. If we examine the food that a hen eats we discover, in wheat for example, that it contains starch and oil (the carbohydrates or fat-forming material), which is the fat of the grain and which, when eaten by the animal, goes to make heat, energy and fat. We see also little grains of gluten, which might be called the lean of the grain, and which, when utilized by the animal, makes the lean meat. We further find the mineral matter (the ash), which might be called the bone of the wheat, and which, when assimilated by the animal, makes bone and egg-shell. Therefore it is easy to understand why it is that when food is deficient in lime and other mineral matter the eggs are soft-shelled; why a ration deficient in protein produces weak, spindling chickens, or a ration containing an excess of easily digestible carbohydrate matter causes the fowl to become excessively fat. Thus we see the

necessity of having properly balanced rations; which simply means that there must be a properly balanced relationship between the food nutrients in the ration in order to produce a perfect animal or a perfect egg. A proper understanding of this secret means profit.

If hens are fed their grain feed in such way that they have to exercise vigorously to get their daily feed, they are much more apt to lay than if fed plenty of prepared feed in troughs, allowing them to remain idle. This is *very important.*

The value of grains for poultry feeding are about in this order: Wheat, oats, corn, barley and buckwheat. Corn makes fat and furnishes fuel. It should never be the exclusive grain diet. The cry of "cholera" comes mainly from sections of the country where corn is principally fed to fowls. Strictly speaking, these "cholera" cases are indigestion. Indian corn should always be fed in conjunction with some protein food like wheat. Both barley and buckwheat are fattening. Too much of the latter has a tendency to produce costiveness; it also will whiten the flesh of the carcass if fed liberally.

For the purpose of producing white flesh, feed oats, buckwheat and skim milk; and to produce yellow flesh feed boiled pumpkins, turnips and yellow corn.

Beans, being highly nitrogenous, are excellent as a variety in the bill of fare. Pop corn contains more nitrogen and phosphates than the regular Indian corn. In feeding grain at night, it should be given an hour before dusk, so that the fowls can well fill their crops before going to roost.

The majority of fowls get far too much grain, such as corn, oats, wheat, bran, etc., to the exclusion of animal substances and green or vegetable foods, such as clover rowen, grass, cabbages, beets, turnips, etc. Grain is a very heavy, hearty, heating and concentrating staple of diet, and was never intended to be fed stock without other addition.

English authorities say we American poultry raisers feed entirely too much maize (corn), and I know that this is so. We do not, as a rule, give enough variety. The farmer seems to think that all the hens need is enough corn so that they can help themselves at will, and the reason they assign for poor winter laying is that it is unnatural for a hen to lay at that season. As one "expert" asserted: "It takes the warm suns of spring to thaw open the ovaries." The secret of corn is *not too much.*

Dr. P. T. Woods' Laying-Food Secret

Nearly all commercial "laying-foods" now sold to poultrymen can be improved by adding "gluten feed." When so improved and fed as a dry mash the increase in egg yield is remarkable.

Take of the ground-grain, ready-mixed, commercial laying food, 4 measures; best yellow gluten feed, 3 measures; coarse wheat bran, 1 measure; mealed alfalfa or mealed clover, 1 measure; best meat meal, 1 measure. Mix. Keep before laying stock all the time in an easy-access food hopper. In addition feed fresh green food freely. To each twenty-five hens also give as first morning feed in scratching litter one quart of clean, bright, cracked, yellow corn. At noon feed in litter one pint hard sound wheat and one pint heavy clipped white oats to each twenty-five hens. Keep water, grit, oyster shells and charcoal always before them.

This plan is for laying stock for market eggs only. It is too forcing for breeding stock for best results. Early hatched pullets and hardy, vigorous yearlings, that do not bag down behind, are best to force for eggs. Do not give them too liberal range. Confinement in fresh-air house and small runs is better where eggs alone are wanted.

Do not keep any male bird with this market-egg laying stock. It saves his food. The hens lay better without him. It prevents blood clots, streaks or spots in the eggs. Sterile or virgin eggs so produced keep better, taste better and sell better. Twenty-five to fifty layers may be kept in one flock.

Feeding Linseed Meal

Oil cake meal is linseed meal. It is the product of linseed oil factories. It is rich in albumen. Properly fed it promotes general health and keeps the fowls in proper condition. During the molting period it is especially beneficial.

I find that five pounds mixed with one hundred pounds of ground grain is the right proportion to feed. This discovery has been a valuable one to me.

Linseed meal is very fattening, and therefore must not be fed too strongly. An over amount is pretty sure to bring on cases of looseness of the bowels.

Thos. F. Rigg's method: He uses linseed meal in the soft food for both breeding stock and growing chicks. He uses it in the proportion of about 1 to 10,—that is, one part linseed to ten parts mixture of cornmeal, wheat bran and ground oats. This he feeds to the chicks once each day, the mixture being thoroughly cooked.

Oil meal regulates the bowels and keeps the chicks in a healthy condition. This means extra money to you.

Meat

Animal food is a necessity, but too much of it is apt to cause digestive troubles. There is more albumen in a pound of meat than in a bushel of corn.

A meat diet, judiciously fed, will materially increase the egg supply. Nearly all breeders are aware of the value of animal food; but, though considered necessary to make up for the lack of insect food, it should be fed sparingly and not too often to the young fowls, for *too much animal food is worse than none at all*, and is one of the principal causes of all the disastrous diseases which are hard to cure. I would not take $20 for this secret.

Meat scraps must be kept in a cool place.

Of the commercial meat scraps on the market, those guaranteed to be pure beef scraps are best. Dried blood, such as is sold for fertilizer, is *dangerous to use for poultry.*

Some feed horse meat. I would not, knowingly, feed horse meat to fowls. The meat of a healthy horse, killed on account of some accident, would be good, but the bulk of horse meat comes from horses that have died or been killed on account of ailment or old age. The secret of profitable eggs is *high quality.*

Green cut bone, when it can be had fresh, and fed as soon as cut, is excellent. It is not a stimulant, and consequently there is no unhealthful reaction from its use. But it should be fed judiciously, *as a too liberal feeding is apt to produce worms in fowls.* An ounce, per hen, two or three times a week, is sufficient. In fact, it should be the limit. Feed separately in a trough, and not mixed with the mash.

Salt

A proper amount of salt aids digestion. It has a tendency to ward off disease by keeping the fowls strong and vigorous. But if given to excess will produce inflammation of the mucous membrane. An excess, too, is apt to cause bowel troubles and loss of feathers.

Salt keeps the whole system in good working order, freeing the blood of impurities, thus avoiding colds, canker, or roup. Salt also has a tendency to expel those miserable wiry gizzard-worms often found in fowls.

It is generally conceded that an ounce of salt is sufficient for the soft food of one hundred fowls. The best way to salt the food is thoroughly to dissolve sufficient salt in the hot water with which the mash is to be moistened. This will more evenly distribute it. The above pointers seem trivial, but *are not.*

Charcoal, Grit, and Oyster Shells

Charcoal is not only a great corrective of the evils of injudicious overfeeding, but is also a good remedy in bowel disorders of poultry.

As it has wonderful absorbent powers, especially for gases, it should be kept in a thoroughly dry vessel with a close-fitting cover, so as to exclude the air.

It is a good plan to mix powdered charcoal twice a week in the mash.

If charcoal is well heated before given to the poultry, it will have a tendency to drive off impurities which may have become absorbed, and will be equal to fresh charcoal.

Grit must be hard and sharp. Oyster shells are too soft to serve this purpose. *Lack of this secret causes many failures.*

The supply of grit should never run out. It is best kept in a small box constantly within reach of the fowls so that they can help themselves at will.

The hens must partake of a certain amount of lime in some form other than that found in the different articles of food. This lime is needed for the formation of egg shells, and where there is a lack of it, soft-shelled eggs are the result.

Green Feed

It will be noticed that fowls, if given some cabbage or other winter greens the first thing upon opening up the houses, will pitch into the stuff to the exclusion of any grain that might be within reach. It seems to act as a sort of "bracer," "eye-opener" or "tonic."

Cabbage, raw potatoes, beets, turnips, and other roots chopped up about the size of whole corn, are all keenly relished, and do a lot of good.

A very good substitute for green food is cooked or steamed cut clover hay or alfalfa. This can be mixed with an equal quantity of ground grain. Laying hens, especially, should be regularly fed cut hay during winter, as it is bulky food and contains considerable lime and other ingredients that go to making eggs.

Boiled vegetables are relished, but care must be taken that they are not too freely fed, as they have a tendency to overfatten, *and are apt to cause bowel troubles.*

The Secret of Feed at 15 Cents per Bushel

The value of green food for poultry, both as an egg food and a ration for maintaining a healthful condition, has been known for years, but of late a method for producing sprouted oats

feed has been practiced by a few knowing poultry men who have derived considerable profit from the idea. I give the methods of two men, Mr. J. B. Upson and Mr. Keyser. This is the "15-cents-a-bushel-for-feed" secret, advertised and sold at a high price in former years. For cheap green winter feed the plan is invaluable.

Mr. Upson's method: The oats are placed in a water-tight vessel and covered with warm water, and allowed to stand twenty-four hours, when they are emptied into a box that will allow the water to drain off freely. Oats are left in this box, and wetted twice a day with warm water until the oats have sprouted a quarter of an inch long, when they are spread in boxes about an inch deep. The sprinkling is continued until the oats are as large as desired, which is generally four or five inches in length. The hens will consume roots as well as tops.

With a temperature of 60°, ten days will bring this result, so that after the first start this green feed can be provided for each day. Chicks a week old will eat the oats, and, in fact, leave all other feed for them. Fowls prefer sprouted oats to lawn clippings.

The green color can be given to the oats by one day's exposure to the light. They grow as freely in the dark, and the boxes can be stacked over one another if short of room.

L. E. Keyser's method is as follows: Place the grain to be sprouted in a tub and cover with water (warm water is best) and allow it to soak for twenty-four hours. Pour off the water and let them drain for half a day, then cover the racks with old sacking, single thickness, and spread the grain upon the racks to the depth of about two inches. If space is limited, the racks may be piled one upon another, and if out-of-doors a cover should be made for them that will turn rain.

Night and morning the racks are taken down and the grain sprinkled with hot water, the hotter the better, using a hand watering-pot. The racks can then be replaced. It does not matter if the water in the upper racks drains down into those beneath, as it will all run off in time.

When in proper condition for feeding, the sod will be three or four inches thick, and the growth of top will be four to six inches high. When feeding, give a block about a foot square to fifty hens. Each rack holds about a bushel and a half of grain before sprouting, and will make sixteen feeds for fifty hens. It will answer the purpose of one grain feed and green food.

The racks referred to are made as follows: A frame of 1x3 inch stuff, set edgewise, 4x4 feet, with a partition in the center, is first made. To this frame securely nail lath, placing them from one-eighth to one-quarter inch apart. This makes a box 4x4 feet, three inches deep, with a slatted bottom and a partition in the middle. The center partition is only for the purpose of strength-

ening the lath. The lath should be soaked in water over night, so that they will not split when nailing.

The Sprouted Barley Secret

A Connecticut poultry raiser has had surprising success with barley. He says: To get green poultry feed barley is the best grain. Cover as much as you need with very warm water, and let it remain for 24 hours. Then draw off the water, emptying the grain into a shallow box having holes in the bottom. Keep it quite moist with warm water and turn frequently so it will sprout evenly. Set in a sunny or warm place, covering with sacks, and in a few days it will germinate and start growing. Then when healthy, green sprouts show, use as feed. Have a number of boxes in the work to keep a supply.

Smith's Secret of Preserving Vegetation in Poultry Runs

A. C. Smith, a successful New England poultryman, gives a secret of preserving vegetation in poultry runs which he has followed since 1896. Mr. Smith writes:

The idea is simple and consists of building small yards for each pen in the house, and one large yard for every two or three small yards. The small yards are directly in front of and connected with the house, and the larger yards directly in front of and connected with the smaller yards. Nothing could be simpler, and simple as the arrangement is, it brings with it greater benefits than may appear at first thought.

To preserve the sod or root of whatever green crop is growing in these enclosures, several little wrinkles may be utilized. If the season is dry and the supply nearly exhausted, the flocks may be kept in the small enclosures until rain comes to refresh vegetation, or the fowls may be let out only part of each day, taking advantage of the fact that the nature of a hen prompts her to dig and scratch early and graze later in the day. Consequently, the sods and roots would be best preserved by letting the fowls have the run during the later part of the day.

As to expense, it is most obvious that where two fences take the place of three there is a saving of one-third involved, or where two take the place of four, which is the case if one large yard is built to every three small ones, the saving becomes 50 per cent.

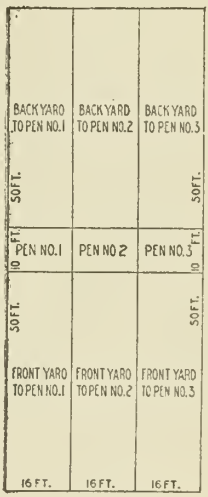
The long poultry house, as usually built, is divided into small pens not more than twelve or fifteen feet wide at the most, and generally only ten. The usual practice is to build a yard to every pen in the house, which, of course, makes the yards just

the width of the pen, which in such case is too narrow to allow fruit trees to do their best. With yards twenty or thirty feet wide, ample space is offered for plum, pear or peach trees, and the fences will not interfere with proper growth, neither are the fowls liable to fly from one yard to another by aid of the branches even with fences of the ordinary height of six to six and one-half feet.

An Important Feeding Secret

The writer has a double run to each house, as shown in the illustration. While the fowls are occupying the one run, in spring and summer, the vacant run is planted to some vegetable crop. As soon as this crop is gathered, the fowls are turned into the plot and they find considerable green stuff as well as worms and insects. The former lot is then planted to rye, and by fall and even during early winter and spring, a quantity of green food is secured by each day mowing down sufficient for that day's feeding.

Rape is another valuable green food, and should be planted each year.



DOUBLE YARD TO EACH BREEDING PEN

While the one yard is occupied the other is sown to a green crop.

Miscellaneous Feed Pointers

The laying hen is a hard drinker. She will consume about a half-pint of water a day, and it must never be left out of the bill of fare. It is the rule on the farm of the writer to water the fowls about a half-hour after feeding the morning mash. They will not suffer by being compelled to wait for the water in the early morning, and they are not so apt to chill when they have first taken food in the crop. To learn to water your hens properly is worth ten times the cost of this booklet.

A pound of cornmeal will measure about one and one-half pints; middlings, one quart; ground oats, two and one-half pints; wheat bran, three pints; clover meal, two quarts.

"Shorts," according to Webster, is the bran and coarse part of meal, in mixture. In some sections of this country bran is known as "shorts," and in other places middlings bear that term.

Brewers' grains contain about four pounds ash (lime, etc.), five pounds fat, twenty-five pounds protein (flesh and albumen formers), and about fifty pounds of starchy matter in one hundred pounds—the balance being water.

In this country, poultrymen generally claim that there is no saving in boiling the food, notwithstanding the increase in bulk,

as they say that there seems to be a corresponding lessening of its sufficing properties; and that seven pints of boiled oats will be consumed in the same time and by the same number of fowls as four pints of the dry grain. But still I have found that there is economy in feeding the boiled grain in fattening, as it has been proved beyond a doubt that the fowls will fatten more readily with the latter.

The bones of the neck, and along the back are the easiest to cut in a bone cutter. The bone itself is full of animal matter, as well as lime and phosphates, for the making of greater bone in the chick, and adding to the feather growth, and for the making of the egg shell. The gristle, the scraps of meat adhering to the bone, with the blood, make a kind of "worst meat" mass, of which the chickens will eat every bit. The small bits of bone through the mass make the ideal grit supply also.

The crate-fed bird has a better appearance than a pen-fed one, and is not a flabby fat, but has nice solid flesh.

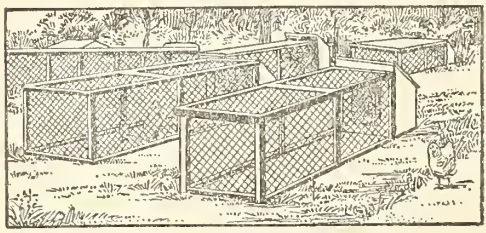
Soft roasters fed in houses show more average gain than when fed in crates. Forty birds may be put in a house 7x20 feet, with a yard 10x15 feet.

In crate feeding, if a bird will not accumulate fat during the first ten days it is shut up in the crate, it is very much wiser to take it out. When you put them in the crate you should starve them for the first day or so.

Some birds can be put in a crate for two weeks, and fed three times a day, and money will be lost on them. On the other hand, some birds can be fed in that way for five weeks and still make a profit. Some birds are ready in ten days and others after being fed for two weeks will commence to go back in weight.

Chick Feed Secrets

Here is a secret that will surely help you: The cost of food, per chick, to weigh one pound, is three cents for ground grain; or three and seven-tenths on whole grain.



PROTECTED CHICK RUNS

Measure: 2 feet wide and 2 feet high, 12 to 16 feet in length, covered with one-inch wire netting. Should be moved to new ground every two weeks. Used by hen and her brood.

An easily prepared chick food: Six pounds cracked wheat; two pounds finely cracked corn; one pound rolled oats, or pin-head oatmeal; one pound millet seed; half-pound broken rice; two pounds fine granulated beef scrap; half-pound granulated bone; six pounds pearl grit. This is the same as expensive prepared chick foods which cost twice as much.

Robert J. Terry's secret formula: For chick food, to be given after the young are a day or two old (before that time dried bread crumbs should be given): Cracked wheat, twenty-five parts; hulled or cut oats, fifteen parts; white millet seed, twelve parts; small cracked corn, ten parts; small cracked peas, six parts; broken rice, two parts; rape seed, one part; small grit, ten parts. Rolled oats can be used in place of hulled oats. The food is fed dry and brings good results.

Seely's Secret of Dry Bran Feeding

James H. Seely, one of the pioneer broiler raisers of Hammonton, N. J., and late poultry manager on the farm of ex-Vice-President Levi P. Morton, here gives a secret that he has practiced and kept sacred for years. The way he discovered it was as follows:

I had a lot of broilers in the brooder house, hatched during the months of December, January and early February, from which I selected 105 pullets, which I decided to keep for winter eggs. Being forced for broilers, they, of course, became rather fat, but, nevertheless, in July some of them began laying. The eggs being very small, they were of no particular use to us, so I shut off their regular feed, and instead filled the trough with dry bran, keeping it before them all the time, for about six weeks.

Then I commenced feeding for eggs and soon got them, 90 per cent. being strong, large eggs, showing good fertility. The pullets kept up this laying for the rest of the season.

I also discovered that this same method worked well with old hens for winter eggs. In that case I shut off the feed for a month (substituting dry bran), when the eggs were cheap. This threw them into an early molt, and again started to lay at a time when eggs were scarce and the price necessarily high.

Gowell's Fattening Secret

If chickens intended for market, weighing one and a quarter to one and a half pounds, are placed by themselves in a house with a yard say twelve feet square, and fed on a porridge three times a day, they can be gotten ready for market in very short order.

The porridge is made of six parts cornmeal, two parts middlings, one-half part linseed meal and two parts beef scraps, by weight, and mixed with milk or tepid water.

Feed all they will eat in one-half hour, when the troughs must be removed and cleaned. Keep the yard clean by covering with sand, straw or hay. The birds will stand this feeding for two or three weeks with good appetites. When they commence

taking less they are ready to be dressed for market, and should weigh two and a quarter pounds dressed. (Note: I have used Prof. Gowell's secret method with great success.)

Gray's Secret for Quickly Fattening

Ivan B. Gray, a successful raiser of broilers and roasters for market, uses the following secret in fattening his stock, and says that at no time of the year has he any trouble to dispose of his broilers, roasters, or even old hens, and always at several cents per pound advanced price over the market rate.

The secret is to feed molasses to the stock being fattened. He uses the common stock molasses, which can be purchased very cheaply in any of the large cities.

He dilutes one quart of molasses in six quarts of water (sometimes using more and sometimes less molasses, according to the condition of the bowels).

With this molasses and water mixture he uses enough to make the following mash crumbly: One hundred pounds yellow cornmeal, 50 pounds wheat middlings, 15 pounds oil meal, and 25 pounds beef scraps. (Note, the Gowell mixture, given above, can be used with the molasses and water solution.)

Confine the fowls in a pen or small yard, and feed all they will eat up clean, removing the troughs as soon as the fowls are through eating. Should the bowels become loose, he simply adds a handful or two of middlings to the mash, and if this does not correct the trouble, he withholds the molasses for a day or so.

The above plumps the fowls very quickly and adds weight, while the molasses also gives the carcass a very sweet and juicy flavor.

Greiner's Corn Feeding Secrets

T. Greiner, of New York State, an experienced and successful poultryman, has demonstrated the following facts in regard to feeding corn:

Corn, of all cereals, is just the one for which all fowldom seems to have a very marked preference, just as children have a preference for candies and rich cakes.

Hens will fill their crops to the very limit of capacity with corn, in less time and with less effort than they could with any other cereal.

The exclusive or excessive use of corn, while permissible and useful just once in a fowl's life (shortly before it is sent to the block), will lead to all sorts of evils in a flock of layers, and will cripple the prospects for a big egg-yield. In the hands of the careful feeder of poultry, it is a good, useful and almost indis-

pensable cereal, and a great aid to success, especially during the colder portions of the year.

Some of the best ways of preparing and feeding corn to poultry seem to be little known to the general poultry keeper, and so are little practiced.

The process of cracking does not add anything to the food value of whole corn, but gives a chance for a loss of some of the smaller particles, besides adding the expense of cracking to the cost of the product. The tremendous digestive powers of the larger birds will take care of whole corn nearly as readily as of c acked corn. The secret of the advantage of cracked corn is mainly the greater demand for effort and exercise on the part of the hen which hunts for it among the litter of the scratching shed.

But there are even better ways of feeding corn than giving it in cracked form: *The secret is in feeding it on the cob.* Let the corn get some age, rather than feed it new. It is safer. But even new corn can be made safe for feeding if you know this secret: Place the ears in a hot oven, and let them get hot, brown, perhaps even scorched and charred. Then take them out and feed them while still warm, on a clean floor, for an evening meal. The hens will work with the ears, pick at them, and soon get the corn off the cob—with effort enough to afford proper exercise. The scorched and charred portions of corn take the place of charcoal, and promote the hens' general health. In mild weather, with good sound corn, this heating will not be required.

Another secret: Run the ears through an ordinary feed cutter, cutting them in about two-inch lengths. The passage and pressure between the two iron rollers loosens the kernels sufficiently so that the hens can more surely pick off every single one. If you will watch a flock of hens, toward evening, busily engaged and hugely enjoying themselves with a quantity of corn on the cob thus cut, you will at once believe that you have discovered a secret worth knowing.

McGrew's Secret of Feeding During Molting

T. F. McGrew, one of the leading authorities on poultry culture, sends this secret:

If properly handled and fed on a feather-forming ration, poultry will molt much more satisfactorily than they do when fed in the ordinary way. The following mixture is for mash food. The receipt is sufficient for 100 hens:

Put 3 pounds of short cut clover or alfalfa hay in a bucket and cover it with scalding hot water. Let it stand for at least 2 hours, and stir into this the following mixture,

2 pounds wheat bran,	1 pound ground oats,
1 pound wheat middlings,	1 pound beef scrap,
1 pound cornmeal,	1 pound linseed meal.

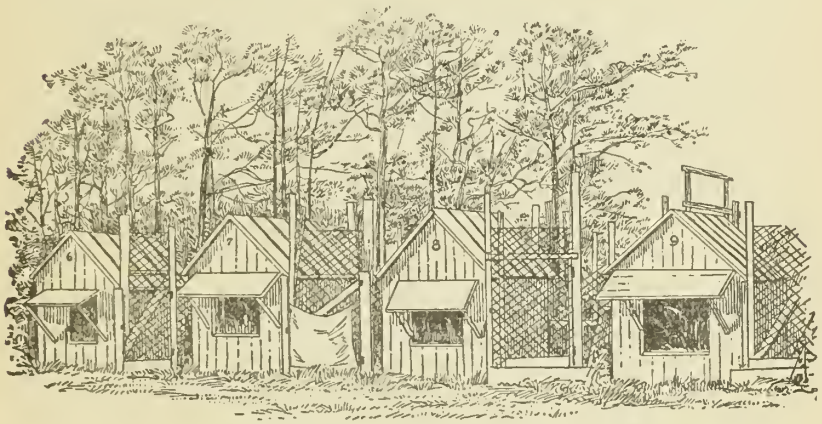
Mix all into a crumbling mass and feed while warm (not hot) to the hens.

When the molt is under way, add 1 ounce of linseed meal each day until you are feeding 2 pounds of it or 20 per cent. of the mash. Feed this until the molt is almost finished; then reduce to the original amount of linseed meal. The original mixture is an almost perfect egg-producing ration and can be fed either as a dry or wet mash.

Secrets of Housing and Care

A poultry plant should be planned with a view to saving steps. This extra labor costs money, for which there is no equivalent. Besides, houses built on the colony plan are far more expensive than if in one continuous line. By bringing them together, one end of each house is saved. This will mean quite an item in lumber. The colony houses, too, are much colder than a continuous house.

High ceilings in houses are expensive, and cold. They should be built as low as possible without danger of bumping heads. *Low houses are kept comfortable by the animal heat thrown off by the fowls.*



COLONY CHICK COOPS

Measure 4 x 4 feet, ground floor, and 4 feet high to peak of roof. Yards 125 running feet. Large enough to start 50 chicks, decreasing number of chicks as they mature.

The working unit in building a hen house is the floor and air space required for each pen. Prof. Rice has discovered that a safe working rule is about five to six square feet of floor space for every fowl. The lighter breeds, because they are more active and restless, require about as much room and air as larger breeds.

There is a great difference of opinion as to the best method of calculating the number of fowls a poultry house will accommodate. The common method of calculation is based upon floor space, the height being considered immaterial. Houses built on

this principle are low, and consequently the least expensive that can be constructed. Another method of calculation is based upon the amount of perch room, while the third is based upon the volume of cubic contents. *The right method is to allow at least ten cubic feet of space per fowl.*

In view of the widely divergent views on this subject, and the lack of definite knowledge, K. J. J. Mackenzie and C. S. Orwin, of the Southeastern Agricultural College of England, undertook a series of experiments to determine more definitely the amount of air space required by poultry. They studied the frequency and rate of respiration in fowls, the amount of carbon dioxid thrown off, the amount of vitiation of the air which the fowls could stand without injury, and examined different types of poultry houses with reference to their suitability for furnishing proper conditions of ventilation.

Assuming that the air of poultry houses should not contain more than nine parts of carbon dioxid per 10,000 of air, they estimated that each fowl must be supplied with about forty cubic feet of air per hour, the requirements of small fowls being practically the same as of large.

In wooden poultry houses with ventilation at the top the air apparently changes about four times per hour. Each bird must, therefore, have ten or more cubic feet allotted to it. Now then:

The number of birds a house will hold depends on its volume and not on the floor space or perch room. The maximum number is found by dividing the volume expressed as cubic feet by ten. I have learned to keep within this number.

The greatest capacity can be most economically obtained from a given amount of timber if the house is cubical in shape. This cannot be quite realized in practice owing to the necessity for a sloping roof, but the nearer one gets to it the better.

In building long, continuous houses, the pens should be divided by tight partitions, either cloth or boards (the latter preferred), to avoid draughts. Otherwise cold and dangerous air currents will be formed whenever windows, doors or ventilators are open.

Prof. Rice says that when air is warmed it expands and rises; cooling has the opposite effect. He further says: Provide the houses with good ventilation. Pure air is as necessary to good egg production as pure food and pure water. Damp air may be removed by ventilators, which will necessarily make the house a little cooler. Warm air rises.

But here's my secret: *Scratching-shed houses do not need ventilators.* They are self-acting in that respect. If the curtains are drawn up each morning, the fresh air will quickly enter, and the pens will receive the very best airing. On the farm of the writer, no ventilators are placed on the houses, but the scratching-shed plan is used. The result is that the houses never have a foul

odor, and the fowls get the benefit of the outside air without being compelled to face rain or snowstorms, or heavy winds.

The roof is practically the most expensive part of a house. It is important that the best attention be paid to it. Some poultrymen prefer shingles, and some heavy roofing-paper. There are advantages and disadvantages in both. Frost will gather on the shingle roof, inside the house, unless the roof is ceiled. This makes an additional cost. Shingles, too, are apt to warp in time, causing leaks in the roof. But a shingle roof, well put on,—using No. 3 eighteen-inch cedar shingles, and giving the roof a coat of paint, will be better. One gallon of paint will cover 250 square feet of shingle roofing. Some of the earlier roofing papers did very well until there was a break in the paper, and then the first good, strong windstorm would quickly tear it all off. But to-day we have roofing that is strong and durable, looking very much like tar roofing, but which contains no tar. *Tar roofing contracts and expands with the weather, but this new roofing does not.* The roofing is put on with tin caps, and then the seams are cemented, and the entire roof coated with a graphite paint. The writer has such roofs on his hen houses, and has had them for quite a number of years. They are as good to-day as the day they were put on. This hint saves money, and yet few builders know it.

There seems to be quite a difference in opinions regarding the proper flooring for poultry houses. Some writers claim that board floors, heavily covered with sand, are the best, arguing the point that they are more dry. Others prefer concrete cement, for the reason that it is rat-proof and easily cleaned. *My secret is to use nothing but the natural earth.* If there is a brick foundation around the hen house, and the floor is filled up a foot with earth, making it that much higher than the level of the outside ground, the floor will not only be dry and rat-proof, but the hens will find more comfort in it, and will not only have something to scratch in but will be able to wallow in it, taking a needed dust bath.

The perches in the houses should be not over two feet from the ground floor, and about six inches under these perches there should be placed a solid board platform to catch the droppings. All perches should be on a level. *The best perch is a 2x3 inch scantling, planed and the edges rounded.* It should be placed so that the fowls will roost on the two-inch side. These broad roosts give a fowl the chance to spread its feet, so that it will not be compelled to cramp them to hold itself, as is the case with the old-style round perches.

Take my advice, and see that all nests are made movable. This is so even where trap nests are used. This gives a good chance to take them outdoors and give a good cleaning, which should be done at least every spring and fall. The best way to place nests is to have a board platform upon which to set

them. This platform should be about two feet from the floor, and broad enough so that there would be from eight to ten inches on the platform, in front of the nests, for the hens to walk. *Never nail up nests so that the hens must fly on them.* Trap nests should never be placed on the floor, as the hens are apt to scratch dirt in them, often clogging them so they will not work accurately. Hens prefer semi-darkened nests to those out in the open light.

In heavy-soil countries dust-boxes should be placed in each pen, so that the fowls can wallow in the dirt. In light-soil sections, and especially when the houses have scratching sheds attached to them, no dust-boxes need be provided, as the fowls can dust themselves with the loose dirt on the floor of the shed.

Fencing is another important matter to consider. After trying all or nearly all of the styles of wire-netting fencing, I have gone back to the old Climax mesh, which has proved to be *a money saver and much more durable.* As it is galvanized after being woven, it seldom ever rusts. Some of the new styles are galvanized before weaving, and the result is that they sooner or later rust and break. I have in use Climax wire netting that has now stood the test for nearly fifteen years, and practically is as good as the day it was first put up. The Climax wire netting can be purchased from any dealer in poultry supplies.

In putting up fencing, no top rail should be used. By having the posts eight feet apart, the wire can be stretched by hand, and if carefully done will not sag.

Secret of Successful Yarding

I have found that for best results in egg production yarding is better than free range. I have discovered that for tenderness of flesh in market chickens, yarding is preferable. On the other hand, I have proved that for quick growth of young stock, free range is the thing.

An argument in favor of free range is that the fowls get much needed exercise. So they do, but just as much exercise can be given them where scratching sheds are provided, and where the grain is thrown among litter so they must work for it.

In market chickens, too much exercise toughens the sinews, and the flesh of a yearling bird is tougher than that of a two-year-old fowl yarded. This is especially so where corn has been the principal diet.

On the farm of the writer, a specialty is made of supplying spring roasters to a select retail trade. The reputation of the farm for choice, juicy carcasses is so well established that even at an advanced price the orders cannot be regularly served, they being compelled to go in rotation. The roasters are caged and fed

a balanced ration, are never hog fat, but always in a good condition. The result is, the meat is sweet and tender, and as only the purest of food is given, the flesh is never tainted with some peculiar taste, nor does it have that strange odor so often noticed in poultry direct from the farmer.

But when it comes to raising young stock, especially when growing them for future breeders or roasters, free range gives them quick maturity, and they are all the more hardy for the rough and tumble life they are having.

In the case of broiler raising, however, range must not be given, or the carcass grows too lanky.

But yarded poultry must be well taken care of. They must be regularly fed, must be made to exercise, the houses must be kept clean, and everything possible must be done for their comfort.

Neglected poultry, especially if yarded, will soon be a financial loss.

Secret of Telling the Laying Hen

Before the advent of the trap nest, quite a number of ideas were advanced concerning the general make-up of the laying hen, but none has been so accurate as that furnished by the trap nest. The hen is caught in the act, and is known by the number of the band on her leg. The number is placed on the egg, and at night credit is given on a record sheet kept for that purpose. This method takes time and attention, but is absolutely accurate and conclusive.

There is another secret method for telling the laying hen, and that is by the condition of the pelvic bones. Just as the size of the udder of a cow is a good indication of its milk qualities, so is the condition of the pelvic bones a good sign of the egg-laying qualities of the hen.

The pelvic bones are located at the lower part of the abdomen —in the rear of the fowl—between which the egg passes when it is being laid.

If the tip of the fore-finger fits snugly between these bones, the hen is a poor layer. If it requires the tips of the first and second finger snugly to fill the space between these bones, it is a good layer; and if the tips of the first three fingers are needed to fill this space, the hen is an excellent layer.

A pullet that has not laid, or has just begun laying, will have these bones of the pelvis almost touching. The bones gradually widen as the fowl continues laying, and at two years of age are much farther apart than at one year old.

This method of determining the laying hens in a flock and the cocks apt to produce egg laying strains is the central thought of

the well known and widely advertised Walter Hogan System; Palmer's Method of Selection, sold by C. H. Palmer, Alfred, N. Y., and others. Each of these concerns claims to be the originator of this method, but it is probable that the same observation of the significance of the position of the pelvic bones has been made independently by many poultrymen as long as poultry have been kept.

Two other methods of determining the best layers are given on pages 45 and 46.

Secret of 200 Eggs per Hen per Year

Persistent trap-nesting will produce a 200-egg flock; nothing else will, in my own personal opinion.

Trap nests not only tell us which are our best layers, but we also learn the size and color of the eggs laid, and *which hens lay eggs that are strong in fertility.*

The trap nest will pick out the layers of the largest eggs, enabling the breeder gradually to get his whole flock to produce eggs of the same size. When I began my experiments with traps, I found that seventy-five per cent. of my hens were laying either a white or a light-colored egg; to-day ninety-nine per cent. lay brown eggs.

Lawny's Secret of Insect Killers

Rolla Lawny gives us two valuable secrets—one for an insect powder, and the other for a lice paint—just the same as are offered for sale by some dealers.

For Insect Powder, he says: Take one pint crude carbolic acid and three pints gasoline. Mix in agate pan or earthen crock, and add plaster paris by sprinkling in and thoroughly stirring so that every particle of plaster paris will be wet, until the liquid has all been absorbed by the plaster paris. Spread on heavy paper in a room for excess gasoline to evaporate. Then run through a sieve made of window screen, and the powder is ready for use.

It can be used a number of times by holding the fowl over a newspaper to catch what falls off. Shake the powder well through the feathers. Mr. Lawny says he has found this powder much more effective than six different preparations now on the market, all of which he has given a fair test.

Lice Paint.—Substitute kerosene for the gasoline as directed in the powder, making the formula one pint of crude carbolic acid to three pints kerosene. Painted on the roosts after three o'clock will get many of the body lice from the hens after they go to roost, besides destroying all mites and lice that may come in contact with it. He says he has found this much more efficient than many of the high-priced proprietary articles he has used.

The Secret of Successful Molting

The proper months for molting are August, September and October, but in young stock it is apt to begin a month earlier and in old stock a month later. The older the fowl the more delayed will be the commencement of this period.

The sexes should be separated until the fowl has completed her new growth. In fact, it is not advisable to remate before the first of the new year.

Any weakness a fowl may have is pretty sure to develop at molting time. Molting is not a disease, but the strain in growing new feathers is apt to weaken the fowl, making it more or less susceptible to sickness.

It is generally accepted that it takes one hundred days for a fowl to change its coat of feathers.

Both sunflower seed and linseed meal are valuable additions to the bill of fare at this season of the year. The bill of fare should be rich in nitrogen. Green food is important. *Unless the material in the food is of a feather-making nature, the fowls cannot shed the old coat.*

When a hen receives a large supply of carbonaceous food she increases her fat without supplying the necessary elements needed in the renewal of the feathers, and there is a general wasting away, inactivity of the bird, and death. When no stimulant is given, the shafts of the new feathers seem to stick on too long, not splitting open freely.

Zimmer's Secret of Securing Foster Mothers

F. B. Zimmer, who is a bantam raiser, successfully adopts this method of hatching and rearing his chickens:

I use an incubator for hatching the eggs, and have the hens act as brooders. In many cases the hens have not been broody and on their nests for more than two to five days before the chicks they are to raise are hatched in the incubator, but that is all the better, as then they will set much more quiet, after having the chicks given them, and will brood them more steadily and carefully than if they had been hatching for three weeks and were tired of being inactive.

My method is to take chicks of every color I have hatched, and when it is all quiet and dark, say about 9 or 10 o'clock at night, go out to my hens and place under them chicks of all the different colors. This method has a double advantage. You can give each hen, after you take her off the nest, as many chicks as you choose of any of the colors you have.

As each hen has chicks of the same color as has the rest,

and as they are all of the same age and size, the coops can be arranged close together, and the hens will not kill each others' chicks.

John Robinson's Secret of Breaking Up Broody Hens

John Robinson, a practical Pennsylvania poultryman, has hit upon a novel and quick method of breaking up broody hens. He places the hen in a cage built entirely of lath, there being no solid floor to it. This cage is then hung on the fence outdoors, so that the air can pass through. Being hung up in an airy place the hen becomes confused, diverting her attention more to her situation than her condition, and consequently in twenty-four hours the broody fever leaves and she can be placed back in the pen with the other fowls. During the time she is placed in the cage the hen is deprived of both food and water. In some instances it was necessary to put them in the cage for a second day after having given them food and water, but he has never found it necessary for more than two days with the most obstinate case.

Secret of Chicks Dying in the Shell

C. F. Townsend, President of the National Poultry Association, writes that the secret of so many fully-developed chicks dying in the shell is not through weakness, but due to the fact that they were smothered. He adds: "The remedy is easy. If you have properly tested out the eggs, there should be none left except those that are hatchable. Therefore, at the end, if any fail to pip, have ready some water as hot as the hand can bear. Dip the eggs in this for a moment, and then remove them quickly to the outer air. In a great majority of cases the chicks will hatch and will be as strong and lively as any of the litter."

Miss Frances E. Wheeler gives the same reason for chicks dying in the shell, and adds: "When struggling to extricate themselves from the shell, they surely need more instead of less air than at any other time. Therefore the closing of the valves of the incubator at this critical period must injure the hatch. While a hen sticks to her nest for the last forty-eight hours, she sweats heavily, and swells out her feathers, keeping them ruffled out as during no other period of the hatch. In this way she gives even warmth, extra moisture and extra ventilation.

"My experience is that eggs need considerably more air and moisture in the incubator all along the trip, than is usually recommended. If plenty of moisture is supplied, evaporation of

the air space will not be excessive, even with the valves two-thirds open, and in a rarified atmosphere.

"If the incubator temperature runs too high, the hatch may be saved by removing the trays from the machine and sprinkling the eggs with tepid water, returning them to the incubator when the eggs are reduced in temperature to ninety degrees. But a harsh or extreme atmospheric change must be avoided to prevent disastrous results."

Secret of Scaly-Leg Cure

While grease—lard or vaseline—and kerosene, will greatly assist in ridding fowls' legs of scales, the most positive and the simplest treatment the writer has tried is thoroughly to coat the legs with gas tar. When the tar wears off the scales go with it, leaving the legs clean and fresh looking. This gas tar can be secured at any gas works. Zenoleum, a coal tar product, is also very good.

RIGHT WAY TO CARRY A FOWL

Note the ease of the bird. There is no undue pressure on any part of its body.

WRONG WAY TO CARRY A FOWL

Note how the breast is bulged out.

Blanchard's Secret of Stopping Cocks from Crowing at Night

W. J. Blanchard writes: For thirteen years I kept Leghorns in a city, only one block from the city hall. We lived in "Doctor's Row" (nineteen of them), and of course they did not like to be kept awake at nights by cocks crowing, and thought I would have to sell the males, but as I was watching them crow the thought dawned on me that a bird could not crow unless he threw his head way up. So I built some coops for spare cockerels right over the roosts, only about a foot above, and every time a bird thought of crowing he threw up his head and struck the bottom of the coop. This would so scare him that he forgot to crow. It worked to perfection.

Egg Secrets

Brown's Secret of Preserving Eggs

Judge George O. Brown writes: I have packed eggs in summer in boxes in salt, when eggs were selling at twelve cents a dozen, and sold them in January for thirty-five cents a dozen. These eggs were infertile, no males running with the hens.

I put in a box a layer of two inches of salt or dry oats. The eggs were placed close together (but not so they will touch), with the big end down, and then I sifted salt or oats on the layer of eggs to make a foundation for another layer, and so on until the box was full. I then took the box to the cellar, and placed it on scantling supports to keep it off the cellar floor.

By placing the eggs big end down, prevents the yolks settling to the shells, as the air bubble will hold them up. Only clean eggs should be packed; dirty eggs should never be washed with water and then packed, as they will not keep so well.

Secret of Killing the Fertility of Eggs

Fanciers, after the season for selling hatching eggs, generally market their egg crop for table use; and, in order to prevent any one from hatching those eggs, resort to various tricks to kill the germ. Some dip them in boiling water for a few seconds. This partially hardens the albumen, and the eggs taste as though they were stale. Others smear the egg with lard so as to close the pores. This causes the germ to die and the egg quickly spoils. And still others make a hole in the egg with a needle which pierces the yolk, causing it to break. Such eggs have the appearance of being addled. All such practices are unfair to the buyer of table eggs.

On the farm of the writer, as soon as the breeding season is over the male birds are removed from the pens, and the egg crop goes to market. Such eggs are unfertile, and being so will keep in a fresh condition twice as long as fertilized eggs. In fact, an unfertile egg never rots.

Secret of Winter Eggs

I have discovered that it is best to have the pullets start laying the latter part of November, and have found that such birds as a rule give the best results during the winter.

To prepare for the winter's work, the pullets should be placed in their winter quarters as early in October as possible, so that they will feel more at home. Moving pullets from place to place will so upset them that laying is often delayed for a month or more.

Large families must be avoided. *For a profit a family of fifteen is best.* Nothing is gained by crowding twenty-five birds in a house that will comfortably quarter but fifteen.

The scratching-shed houses are to be preferred, especially for young birds. These houses admit plenty of air, and induce the stock to exercise by scratching among a lot of litter. Pullets placed in tightly-built houses never do as good work as when they are accustomed to conditions as near outdoors as possible. Another advantage in the scratching-shed house is that the fowls can exercise indoors during bad weather, and are not compelled to endure all sorts of weather. The stock must be protected, and herein is a great secret in winter egg production.

In my experience I have learned that it is most important to have the proper housing, and to have the stock not only early-hatched, *but hatched from eggs laid by winter layers.* That's the real secret.

I use trap nests and keep a strict record of every egg laid between October 1st and June 1st. In making up my breeding pens for the following year I select only the best winter layers—those giving the highest records (as pullets) during the months mentioned. I discard all pullets that do not lay in January. Each year these trap-nest trials are repeated, and in this way each year I strengthen the ability of the stock to give good results in winter eggs. Pullets hatched between April 1st and May 15th should lay well during December and January—they certainly will if properly grown.

Brigham's Secret of Sterility and Fertility of Eggs

Professor A. A. Brigham, principal of the South Dakota School of Agriculture, sends this secret: From time to time various schemes are advertised by unscrupulous or careless publishers claiming to show whether hen's eggs are fertile or infertile. Such a scheme, if it would work, would be of very great value to the poultryman. Unfortunately, however, the fertility of the germ-cell of the egg cannot be detected before incubation begins without breaking the shell, which would destroy the possibility of hatching by the usual methods.

The interested poultry breeder may find it instructive and helpful to inspect several germ-cells as they appear after the egg is broken open. In the common hen's egg the yolk floats about

midway between the ends of the egg and toward the upper side when the egg rests on one side. At or near the middle of the top of the yolk is the germ-cell. The whitish cords of thickened albumen, extending from each of two sides of the yolk to the inner lining at the ends of the egg, help to hold the yolk immersed in the white of the egg and prevent the germ-cell coming in contact with the shell. The circular whitish germ-cell is only about one-eighth of an inch in diameter. Within this little cell (if fertile) is contained the "life" principle which, under the influences of proper incubation, develops into the embryo and forms the chick. Anyone with keen eyesight can easily detect a difference in the appearance of *fertile* as compared with *infertile* germ-cells.

Open a space about three-fourths of an inch wide through the shell at the side of the egg or carefully break open the egg and cautiously empty the contents into a saucer. The yolk floating toward the top in the white of the egg, carries, imbedded in its upper surface, the germ-cell—a circular spot about one-eighth inch in diameter.

If the female egg-cell is *infertile,* i. e., has failed to become fertilized by the male germ, it has a general whitish appearance, except for minute clear spots distributed irregularly over the surface. If the germ-cell is *fertile,* it usually shows an outer rim, which is whitish and within this marginal ring a clear center containing in some cases little whitish dots.

There is some variation in the appearance of fertile germ-cells because the fertilization of the female cell takes place before the yolk has proceeded far in the oviduct and development of the embryo often begins while the egg is within the body of the fowl.

The perfect fertilized germ-cell is, at first, a single small cell. Under the influences of the body heat surrounding it in the oviduct and because of the life principle within it, this cell divides by cleavage into two parts or cells, each of which enlarges until it becomes eventually as large as the mother cell. Next each of the two cells divides and the parts enlarge. The process halts after the egg is laid and becomes cold, but continues if the egg is placed under a broody hen or in an incubator which provides the right conditions for incubation.

If the poultryman is using eggs on the table it is easy to note whether they are running fertile or not. If he plans to use eggs from these fowls for incubating and finds that some or many of the eggs do not show fertilized germ-cells he knows that some change in mating or management is necessary. As the eggs which are broken open are used for home consumption there is really no loss, and the knowledge that the eggs from a flock show fertility one week is indicative of like fertility the coming week when the eggs are to be used for hatching.

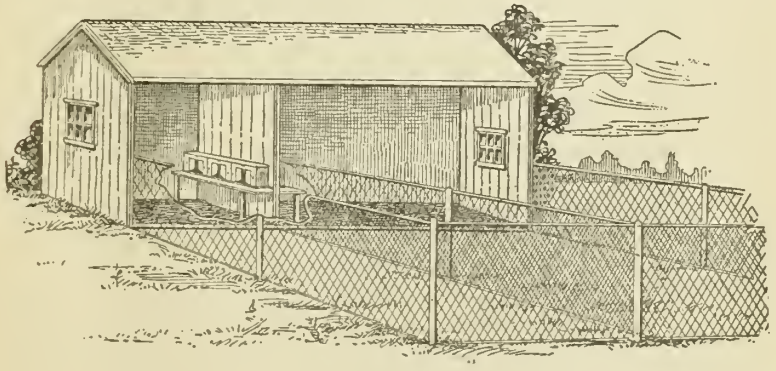
Morgan's Secret of Winter Layers

Henry Morgan writes: "Winter eggs in my yard are always plentiful by allowing all hens and pullets that become broody in summer to rest as long as they want to. I allow them to sit on a china egg for months, which, especially during July and August, brings on the molt, and when they break up their broodiness they often have new feathers and go to work. During October, November and December they are busy laying the eggs which otherwise they would have laid during the summer. This has been my practice for four seasons, and I find it more profitable than to break them up, only to get eggs when prices are low. Selected two-year-old hens are by this system doing better work than pullets.

"I also sort my birds by an examination of the crop after they go to roost at night. The hens that have a full crop are those doing, or going to do, the work, and I cull out all birds too lazy to have a full crop when they are given plenty of feed."

Secret of the Angell System of Securing Fertile Eggs

Briefly stated, this system consists of a yard divided by a house into two unequal parts. One yard large enough for twelve hens, and a smaller yard for the cock. In the house are trap nests with two openings. Every night the hens are put in the larger yard. The cock stays permanently in his own quarters. Every hen that lays an egg or enters a trap nest goes out into the apartment with the male and is promptly served. When night comes, the laying hens are all with the male bird, and they then are returned to their own side of the house and yard, to go



ARRANGEMENT OF TRAP NESTS UNDER THE ANGELL SYSTEM.

through the same process each day. In the morning the male bird is alone in his yard. The author says he should not be allowed to serve more than twelve hens in order to have every egg fertile.

The hens which do not leave their yard are the non-layers, and may be removed.

The trap nest is made by simply fashioning two light doors, using one-inch mesh, wire netting. The door to the nest which the hen enters through to lay is hinged from the *inside*, and is pushed open by the hen, closing behind her. The door in rear of the nest, opening out into the cock's yard, is hinged from the outside. When the hen enters the cock's pen she cannot return, as will readily be seen. These doors, or gates, are light, and work easily, and should be the size of the entrance of the nest box, and hinged to the top.

The little book sells for $1.00, and is published by Albert Angell, Jr., of Orange, N. J.

Secret of Eggs all the Year

During the months of October, November and December of each year, there is always a more or less scarcity of fresh eggs, and the prices, in consequence, go up. This scarcity is due to two things in general: the molting period for old hens, and the absence of early-hatched pullets.

It is at that time of the year that the condition powder and the poultry-food man begins to cry his wares, and it is surprising to see what business he does. While I believe in the tonic effects of a good condition powder, or a scientifically-prepared poultry food, I do not credit these articles with all that is claimed for them.

They should be used with judgment—a little goes a great way. To accustom the fowls to them is but to lose the tonic effect. They are not so much calculated to make eggs as they are to tone up the tissues and to keen the appetite. In that condition the fowl eats more freely and better assimilates the egg food that it gets in good pure grain.

This scarcity of fresh eggs on the farm *can only be remedied by early hatches of pullets.* Pullets hatched in March and April, and well grown, will begin laying in the fall, and continue in the good work right through the winter. The molting hens will again start up in January, and by February the combined work of the pullets and hens will give a big supply of eggs, and it will be noticed that in February the market prices for eggs are on the decline.

The great trick is to get the eggs during the last three months of the year, and this can be done by early pullets given good housing, good feed and good care.

Secret of Having Perfect Eggs

It is common every now and then to read an account in some newspaper of one of the subscribers bringing an extraordinarily large egg into the office of the editor, and the aforesaid editor at once heralds the news as though it was one of great public importance.

Such eggs are important, but not in the same way as meant by the editor. They are important to the poultryman inasmuch as they are danger signals. They tell of an unhealthy condition of the hen that laid them. No strong, healthy hen will lay either a double-yolked egg, a round egg, or a badly-shaped egg. Something is wrong with the ovaries of a hen that lays anything different than a regular-shaped egg. *The main trouble lies in the fact that the hen is overfat.* Soft-shelled eggs can come from one of two things, viz., lack of sufficient lime in the food, or of an overfat condition.

Instead of rejoicing at these extra-large eggs, there is cause for regret. At once the matter should be investigated, and the general condition of the flock looked into. If it is found that all, or the majority of them, are heavy, it is best to cut down the quantity of the carbonaceous or starch foods, and increase the nitrogenous material.

In the main, the egg-eating habit is caused by soft-shelled eggs being laid. The hens get a taste of the egg and thus form the appetite.

To prevent these bad eggs the fowls should be compelled to exercise, and there should be such feed given as will supply plenty of lime, and in addition a small trough of cracked oyster shell should be constantly within reach of the fowls, so they can help themselves at will.

Kohr's Secret of Selecting Layers

J. W. Kohr sends us a unique method of selecting layers that favorably responded to all tests made with trap-nest hens. He writes: Every good layer will, when about half grown, form the position of the feathers along the sides of the comb, and the more these feathers stand up and curl forward, resembling a brush, the better layer she will be. For six years I used this secret, selecting such pullets which had the largest brush around the comb, and my flock averaged 182 eggs per hen per year. Not using trap nests, I cannot say what the highest individual record was.

I discovered this secret about fourteen years ago. My two sons received a present of a hen, which became a great pet and an excellent layer. The boys named her "Old Shorty," and I

noticed that she had loose feathers along the comb that stood up and were curled forward, resembling a brush. I bred her, and all of her daughters that inherited the brush along the comb were good layers.

The value of this secret is that if one wishes to purchase good laying stock, he need not handle them to pick out the layers, as one is obliged to by any other method. You can tell at a distance if the hens are good, medium or poor layers.

Kulp's Secret of Producing Great Layers

W. W. Kulp, one of the most successful poultry raisers in this country, writes:

The trap nest is a sure and good way for picking out great layers, but I know a better and easier method. I built up a strain of Leghorns of which three pullets from one setting laid 726 eggs in one year, or an average of 242 eggs each. They were not forced in feeding.

This is my secret: Soon after I began poultry-keeping as a business, in 1884, I selected my breeding birds according to a type. I selected *hens that were broad across the back* and at the shoulders. These wide hens I have found have plenty of room for the inside works, and are strong and full of stamina. While not all such will prove extra good layers, they form a grand foundation for such a strain.

Mate these hens to a male that came from a hen that laid four eggs in five days, or five eggs in six days. There are hens that will do better than that, but they are not so plentiful. Such a mating will produce pullets that will have the blood line from the male side, the very best mating to start the strain. A hen that will lay four eggs in five days, or five eggs in six days, can make a record of over two hundred eggs in twelve months, providing she is properly cared for. A Leghorn that is a steady layer for two weeks or a month can be put down as a sure layer for the year, and capable of a great record. Be sure that the male is out of a great layer, and as much progress will be made as by the use of trap nests.

Professor Rice's Fat Hen Secret

Professor James E. Rice, of Cornell University, probably the foremost living American poultry expert, gives me the following statement of his conclusions as to the proper physical condition of hens for laying.

I believe that I am not misjudging the natural laws governing reproduction in domestic animals when I lay down the broad, general principle that a condition of pregnancy carries with it a

tendency to fatness. When we apply this principle specifically to fowls we feel justified in assuming that a condition of egg laying is not only a condition of reproduction but also of pregnancy. After a very large number of examinations of fowls in various conditions of laying we find that in every instance, a fowl which is in a laying condition has a large amount of surplus fat in her body, and, conversely, a hen that is not in a laying condition is invariably poor or at least does not show a condition of fatness. It would appear that a poor hen cannot lay.

When we seek an explanation for this condition we find the composition of the yolk of the egg gives us a clew on which to base a theory. The yolk of the egg contains approximately 64 per cent. fat, while the white of the egg and the shell contain no fat. The yolk is the first part of the egg to be developed. It is, in fact, the enlarged ovule that develops from the muscular tissue of the ovary. Manifestly, the first part of the egg, therefore, cannot be developed unless there is surplus fat in the fowl's body.

Observations in methods of feeding also bear out the truthfulness of the above statement, because fowls, in order to lay well, must be given all of the right kind of food that they will eat and digest if they are to give continuous egg production. This is because the egg is made from the surplus nourishment assimilated by the fowl over and above the actual maintenance ration.

The fact that a hen must be more or less fat in order to lay undoubtedly will be questioned by most persons who have not closely observed the relationship between the physical condition of a fowl and her reproduction. I go on record as saying that if we are to get large egg yields we must first so feed our fowls that they shall be reasonably fat and then take our chances on their becoming overfat, which might result, in the end, in fatty degeneration and death. A few hens will generally have a tendency to become overfat without laying. These would, in any event, be likely to prove unproductive by any system of feeding because they inherit a tendency to throw their energies into flesh rather than into eggs, and therefore take full advantage of the opportunity to grow fat when heavily fed. All that we can do to overcome this tendency to overfatness is to keep the fowls in the best possible physical condition by keeping them in clean, fresh air houses and encourage them to exercise freely for all of the cracked or whole grain that they eat, and meanwhile give them all that they can eat up clean once each day of nourishing, easily digestible and palatable meat and ground grain in order to make certain that they have all they can digest. In addition, of course, they should have always accessible bone, oyster shell and grit.

In practice this result can best be secured by letting the fowls become hungry once each day, preferably in the morning, and to have all that they can possibly eat twice each day, preferably

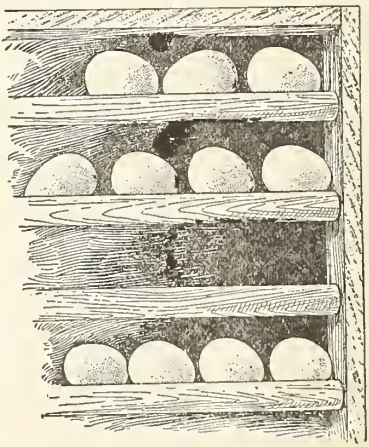
ground feed and meat at noon in case of wet mash, or in a hopper during afternoon if dry mash is used and mixed whole or cracked grains at night. They should go to the roost with their crops full with a little grain left over in the deep litter to induce early morning exercise and feeding.

In view of the above does it not seem reasonable to assume that fowls in order to reproduce themselves must have surplus energy which is stored up in the fowl's body in the form of fat, against a time of need? This, it seems to me, is a reasonable explanation of the well known fact that fowls always eat more for a considerable length of time before they begin to lay, which is followed by an increase in weight before actual production takes place, and the well known fact which anyone can observe, that the hen in her highest condition of reproduction weighs more than at any other time during her life. The natural conclusion is that fowls must be fed not only well balanced rations suited to all of the demands of the body as to protein, fat and mineral matter, but that they must also have a sufficient quantity to satisfy the demands of the body, which are immense. The hen is the greatest known condenser of feed into a finished animal product.

Crane's Secret for Holding Eggs for Hatching

Professor Otis Crane, instructor in poultry at Purdue University, sends this plan for constructing an egg rack. *See illustration.*

The rollers in this rack are made of broom handles, and are placed one and a quarter inches from the back. This back can be the wall or a back can be put on the rack. The side pieces are two and a half inches wide.



The illustration shows a corner of the rack, and also shows how it is constructed. The rollers are put in by nails driven through gimlet holes into the ends of broom sticks. These gimlet holes should be bored three inches apart and one and a half inches from the back.

The advantages of this rack are: Cheap and easy to build; *by turning the roller all the eggs on it turn,* thus saving much time; the rack takes but little room, being against the wall; *the air can pass around the eggs,* and in consequence the eggs can be held for a longer time.

Boswell's Secret of Testing Eggs

John W. Boswell, Jr., one of the leading utility poultrymen in the South, here gives a method which he has used for years in testing eggs on the third day of incubation, and later. He claims the method is infallible in detecting unfertile eggs, and is said to have been used by the incubatories of Egypt and China for hundreds of years. The method follows:

Place the warm tray of eggs on top of the incubator or some other solid place. "Thump" each egg sharply, but lightly, with the finger nail, or tap with the butt end of a lead pencil. The eggs which give a decided "clink" or glassy sound are *unfertile.* Those which give a deader, mellow sound contain a germ which has begun to develop.

A few tests will convince the most skeptical that this is the most practical and infallible method of testing eggs early in incubation. Whether the eggs are white of shell, or very dark brown, makes no difference. The ramifications of the minute blood vessels, and the change which has taken place in the allantois, cause the mellow sound in the fertile egg; while the contents of the unfertile egg remain unchanged, so that they "clink" sharply.

Upon first attempting this way of testing, provide some fresh eggs which have not been incubated. Compare the sounds of these with those of the eggs in the tray. You will soon "catch on" if you have any delicacy of ear, and will never fool with a lamp tester again.

On the tenth day you may test the same way for the germs which have died.

Dr. Woods' Egg Hatching Secret

It is well known that the greatest losses in artificial hatching are through almost fully-developed chicks dying in the shell. To prevent this loss, economize the time of hen mothers, and get the best returns in livable chicks, Dr. P. T. Woods uses this secret method, which has been jealously guarded by a few New England egg farmers for a number of years:

Start your eggs in the incubator when you have a fair number that you wish to set. The fresher they are the better. It is not necessary to start with a machine full. When machine is started, round up your broody hens and get them located in hatching nests on nest eggs to get them accustomed to the place where you wish them to sit. You have this to do anyway if you set hens. Prepare nests in the usual manner with a moist earth or sod bottom, covered with clean hay or soft straw.

By the time your incubator has been running seven to ten

days you should have a number of hens ready to receive eggs. Test out your incubator at this time and give each broody hen from eleven to fifteen of the fertile eggs from the incubator. In this way you should be able to set from four to forty hens at one time on fertile eggs exclusively. The incubator, now empty, may be filled again and the procedure repeated.

This method saves the time of the incubator and the time of the hens. The hens sit only on known-to-be-fertile eggs, and in many cases hatch every egg. The eggs are hatched in from eleven to fourteen days after the hens get them, thus saving time of the hens, an item of importance on an egg farm. The hatch of two hens makes a comfortable brood for one hen, and the remaining broody biddy can be set over again on the next lot of fertiles from the machine.

While it is usually best to transfer the eggs from machine to hens by the tenth day, they may remain in the machine until the fourteenth day if necessary in order to obtain sufficient broodies to cover them. Even when eggs have been kept in the incubator until the seventeenth and eighteenth days the results in chicks hatched under hens by this plan have been good, with very few chicks dead in the shell. Eggs from same lot allowed to remain in incubator until the chicks were hatched showed much greater losses from chicks dead in the shell.

Market Secrets

Secret of Judging the Age of Dressed Poultry

When the writer was a boy, more old fowls were placed in the general market than is the case to-day, as no one parted with their hens until the fowls were so old that they were not profitable for egg production.

To-day, therefore, the poultry buyer is often fooled in his judgment of the age of poultry. A smart housewife taught me the following method of determining the age, and it is certainly a secret worth knowing: When she selected a hen she would note if the spur was hard, and the scales of the legs rough—indications of old age. If the specimen showed very little spur, and if the legs were more smooth, the market women would bend the underbill. If unable to bend it down, and the comb seemed thick and rough, she would refuse to buy, no matter how fat and plump the carcass might be.

A young hen has only the rudiments of spurs, the scales on the legs are smooth, glossy and fresh colored, whatever the color may be; the claws tender and short, the nails sharp, the underbill soft, and the comb thin and smooth.

If the turkey hen had rough scales on the legs, callosities on the soles of the feet, and long, strong claws—or if the turkey cock had a long beard—this housewife knew that either of the carcasses was old.

An expert in dressed poultry can judge the age very closely by using this method: Take the end of the breast bone farthest from the head between thumb and finger and attempt to bend it to one side. In a very young bird (say a broiler or a green goose) it will be easily bent; in a bird a year or so old it will be brittle; and in an old bird, tough and hard to bend or break. Unfortunately, tricky dealers sometimes break the end of the breast bone before showing the bird, and thus render the test worthless.

Mackenzie's method is as follows: A young turkey cock has a smooth black leg, with a short spur. The eyes are full and bright, and the feet supple and moist. The bill and feet of a young goose will be yellow, and there will be but few hairs upon them. If old they will be red.

Scammel's method is: The feet and neck of a young fowl are

large in proportion to its size. A young capon has a thick belly and large rump, a poll comb, and a swelling breast. Young ducks and geese are plump, with light, semi-transparent fat, soft breast-bone, tender flesh, leg joints which will break by the weight of the bird, fresh-colored and brittle beak, and windpipe that will break when pressed between the thumb and fore-finger. In selecting a goose or duck, take hold of the toes and pull them apart; if the web separates easily it is young.

Secret of Dressing Fowls

The following method is practiced by an expert, and is recommended for quick and thorough work in dressing fowls: The carcass is first dipped into cold water and then allowed to drip, after which finely pulverzied rosin is sprinkled over the feathers, using a dredging box for convenience. This being carefully done, the fowl is scalded in the usual manner. The rosin sticks the feathers together so that pinfeathers come out with the others, saving much trouble. Use the common crude article.

Secret of Celery-Fed Broilers

Some years ago a broiler plant on the outskirts of Washington, D. C., secured quite a trade, at advanced prices, for what it termed "celery-fed broilers." Two weeks before being marketed, celery was chopped up fine and fed the birds being fattened. This gave the stock a peculiar wild flavor, similar to the canvas-back duck. It had no pronounced celery taste, but it so changed the order of things that epicures "smacked their lips" and cried for "more."

Secret of High-Priced Market Stock

In these days of sharp competition with breeds of all classes, the beginner is apt to become puzzled by the arguments used on all sides, and is very much undecided just what breed will give the best returns.

Of course much depends upon the kind of roaster wanted. If a medium size is most salable, say four to five pounds at six months of age, I raise such breeds as the Plymouth Rocks, Rhode Island Reds, or the large-size strain of White Wyandottes.

But if a bird is wanted that will weigh from six to eight pounds at six months of age, you should raise either the Light Brahma in its purity, or a cross of Indian Game on Brahma. This cross, by the way, gives a very satisfactory roasting fowl. The Indian Game, being a solid, plump fowl, will add more weight

than would a cross between one of the American or the Mediterranean breeds on the Brahma.

An expert lately revealed to me that he can get ideal roasting fowls best from the Light Brahma in its purity, especially if he first grows a good frame on his birds, and then fills them out with carbonaceous material.

At any rate a bird must be produced that will stand extreme forcing and at the same time have a plump and nice body, with good weight. The prime spring roaster, or, as it is sometimes known, the "soft roaster," is a bird not more than six months of age, and which has the foregoing characteristics. Such a fowl will certainly be good and tender.

In mentioning these varieties it is assumed that the market calls for a yellow-skinned carcass. Should it demand a white-skinned bird, then be sure to raise the Black Langshan in its purity, or a cross of Black Minorca and Black Langshan.

Truslow's Secret of High Prices for Ducks

One of the most successful raisers of ducks, catering to the fancy New York trade, was William H. Truslow, of Pennsylvania. His ducks averaged several cents per pound higher than usual market prices, and his supply was seldom greater than the demand. This is the way it was done:

In the first place, Mr. Truslow had excellent stock, well fattened and prepared for market. He proceeded along well-known lines of duck culture, with no unusual methods or secrets.

In the next place, Mr. Truslow was a close student of his market. He knew just what weight and color of skin his customers favored. He knew at what times of year the demand for ducks is heaviest, and he planned months ahead to have his stock at its best at those times. He saw to it, also, that his shipments could be relied on for regularity, so that customers could have no excuse for going to other shippers.

Where Mr. Truslow's method differed from others was just here: He knew that only where a breeder is able to create a demand for his own particular product, either of poultry or eggs, he will secure the higher prices. As soon as he establishes a reputation, and customers are able to identify his goods, they will insist on having them and are willing to pay more for them. Mr. Truslow thus solved the problem of labelling his ducks wherever they were sold:

He bought from the American Can Company a quantity of

tin tags, an illustration of one of which is shown herewith, and

when each duck was killed, a tag was inserted in the web of the foot. Patrons of the high-priced hotels and swell cafés who wanted an extra nice duck always ordered a "Truslow," and they knew they were getting it by means of this tag, which was left in the foot when the duck was cooked and appeared with the bird on the table. If only a portion of the duck was served, the foot, with the web spread out showing the tag, was placed on the side of the dish as a garnish. These tags were practically the same as those used on plug chewing tobacco, except that the points were longer. They were brown in color, about the shade of roast duck, and printed with black ink.

To apply the tag, he had one point straight and the other bent to a right angle; the straight point was inserted in the web of the foot, the web was then stretched as much as possible, when the bent point was pushed in and then straightened out. The elasticity of the web held it firmly in place. These tags are unavailable for chickens, but no doubt a hole could be punched in the chicken's foot and a tag of a different design attached firmly in some way.

The design of the tag was Mr. Truslow's trade-mark. It was made familiar to his customers and others by appearing on his note head and shipping tags, etc.

Secrets of Exhibiting

Drevenstedt's Secret of Conditioning Fowls for Exhibition

J. H. Drevenstedt, acknowledged to be one of the best judges and authorities in the country, gives the following:

Many an inferior bird has won a prize over a superior specimen because the owner of the former was master of the "tricks of the trade," while the latter was "the man that stood still." The one groomed, plumed and even faked his charge; the other was content to put it in the show pen as Nature grew it.

The secret of success in winning prizes depends largely on the condition of the fowls exhibited. The mere fact that you have grown a chicken to feather out perfectly, kept it free from lice, made it weigh up to standard weight, does not indicate that you have the prize winner. The other fellow has done the same thing with his, and a little more. He groomed and trained his exhibition specimens. To illustrate this briefly, we will cite an instance which occurred at the New York Show about twelve years ago, viz.: A prominent exhibitor had imported a very fine Black Red Game cockerel from England, took him from the steamer direct and placed him in a cage; another exhibitor had a bird of the same variety in a cage close by. When the judge poked his stick into the cage where the English bird was, the latter would try to "fly the coop." In other words, it would not pose or stand while being examined. The American-bred bird, when touched by the judging stick, knew its business and showed its training by posing nicely, and won the prize. Yet the foreigner was intrinsically by far the better bird; it simply was not in proper condition to show its superior points when the judge came around. The secret of showing all Games and Game bantams to advantage is in proper training and handling.

This is a simple matter, which requires patience and kindly affection for the birds in hand. A little petting goes a great way in taming those Game birds. Rubbing the skin under the bill gently from the neck upward and stroking the back downward, slapping the wings, will make the bird show off his gamy qualities in fine form. The oftener you do it the better the chances will be for a grandstand appearance in the show pen. The plucking of hackle feathers to make the neck look leaner, the pulling of the wing feathers, *i. e.*, the primaries, to make them

grow just long enough for a scheduled show, are tricks of a trade that are practiced and seldom detected. One of the chief faults of a Game or Game bantam is a long wing. By pulling the primary feathers some sixty days prior to a show, a new set will appear that is usually about the proper size—for that show. You can call this faking, if you choose, but no judges can detect it, so we must abide by the unwritten law observed by old chicken exhibitors, viz., "Faking is only faking when it is discovered."

In breeds other than Game, training is just as important. All exhibition specimens must be thoroughly handled and tamed by the owner or his help. Granting this has been done, we will come to the other little secrets that help win the ribbons.

Perhaps the hardest classes to exhibit and judge are white fowls. Conditioning White Plymouth Rocks, Wyandottes and Leghorns has become a very important factor in determining the winner at our great winter shows. In fact, it is more of an art than a secret. Every means is resorted to to get a bird white as the driven snow, and the old creed, followed centuries ago by its founders and ever since by apt and willing pupils, viz., "The end justifies the means," must have struck a very deep and responsive chord in the breasts of some of our breeders and exhibitors of white fowl. They certainly stop at nothing to gain their object.

This brings us to the parting of the ways—one road following the natural, the other the artificial, course.

The birds of the air, unrestrained and unconfined by the hand of man, breed, thrive and grow feathers of surpassing beauty. It is the survival of the fittest, the survivors growing their garb in the perfect environment only Dame Nature can offer. But the coloring of wild fowl is far different than that of domesticated poultry. The pampered pets of man must be handled differently to attain the Standard of Perfection ideal in the show room. It is true that natural methods will produce satisfactory results with parti-colored fowls, but with white fowls Nature must be aided by the artifice of man in most cases.

Twenty years ago we heard or saw little of the bleached birds that are omnipresent at our big shows to-day. Yet I remember scores of White Leghorns and White Wyandottes shown in perfect condition with lustrous white plumage and clean yellow legs, that never were subjected to the modern bleaching processes.

One of the leading White Leghorn breeders in the Empire State always showed his birds in splendid condition and won hundreds of prizes fifteen years ago. I was at his farm in the summer of the early nineties and saw several thousand White Leghorn chickens foraging in a big cornfield. The shade

afforded by the tall maize and the rich pickings of grubs afforded by a generous soil and green fodder of the cornstalks, just grew those Leghorns in an ideal way. When rounded up in the late fall, the birds were clean in color of shanks and plumage. The best specimens were selected and placed in large pens, the bottoms of which were covered with clean straw, and here those birds were trained and tamed until ready to exhibit. They were not washed at all. A thorough rubbing of the feathers with a silk handkerchief removed the outer dust, if any, and polished the web; the legs were carefully brushed and oiled with sweet oil; the comb was rubbed with a very small amount of vaseline. That's all. And these birds were winners and looked like such.

To-day it's a different story. Birds must be washed and bleached to get that " dead white " plumage so fashionable and so foolishly demanded by exhibitors and judges. Not only must the plumage be white, but the quills also. As a matter of fact, a real white bird in Nature always has white quills and usually white plumage, albeit a little tinge of straw color will appear on wing-bows and back of males occasionally. Peroxide of hydrogen may remove this, but no chemicals have yet been safely used that will bleach a yellow quill.

Birds intended for the show-room should be selected two months prior to the show, the males separated from the females to avoid breaking of feathers. Each specimen should be carefully examined and all broken and off-colored feathers removed, which, if pulled at this time, may come in perfect, as off-colored feathers are often caused by a bruise or injury to the feather when it is forming. Dust each bird with a good insect powder to make sure that it is free from lice. On stormy days confine the birds to the buildings. If the birds are quite dirty they will require several washings to get them in the best possible condition. The first wash should be about two weeks before show-time.

To wash birds, a warm room, soft water, good soap—Ivory or castile—a sponge, several towels, three washtubs and a requisite amount of patience and care are the chief requirements. Perhaps we might add a little " elbow grease."

Fill two tubs half full with warm water, just hot enough for the hand to feel comfortable in. Rub the soapsuds thoroughly into the plumage, rubbing with the feathers, not against them. Lather the bird thoroughly in every section and remove every particle of dirt. Begin at the head and never leave a section until assured that the dirt is removed. Rinse the bird in the second tub, using the sponge saturated with water freely, until every particle of soap is removed. This is important, for if any soap remains the plumage will come out blotchy and will not take the blueing water evenly.

Then give the bird the final rinsing in the tub of clean, cold water, to which a very slight amount of liquid blueing has been added. The latter is as important as the blueing used to whiten fine linen. Dip two or three times in the blueing water to make sure the latter permeates all through the feathers. But don't put too much blue pigment into the water, as it will show next to the quills in the web of the feathers and lose, instead of win, the prize. After the bird has been thoroughly rinsed in this blueing water, squeeze the water out of the plumage, drying with the towels, place the bird in a roomy coop having a wired or slatted front, the side and top being covered with muslin. The bottom should be covered with clean straw or coarse shavings. Place this coop near a good fire—not a roaring, red-hot one—about ninety degrees is a safe temperature, and in a few hours the bird will plume itself, and when thoroughly dried will look as clean and white as it is possible to make it by legitimate means. Artificial means go further, viz., if any tinge of brassiness is observable on back or wing-bows, a sponge saturated with peroxide of hydrogen, rubbed gently over the surface, will often remove it without injuring the lustre of the plumage or destroying the texture of the web of the feathers. The oxalic acid bleaching process with the talcum powder rub, or magnesia carbonate powder, requires a slick person to apply. It is a method that should be universally condemned, as it is injurious to the feathers and an imposition upon the judge and prospective buyer of birds so prepared. There are persons, however, who make a business of bleaching birds by a similar process. The consideration for changing a brassy-surfaced plumage to a snow white one is usually ten dollars. If anybody desires to fool the public and does not care to expend ten dollars, he or she can experiment with peroxide, oxalic acid, Javelle water, or any of the straw-hat bleaching powders, and possibly obtain similar results.

The bird, being washed and in fine plumage, now needs the finishing touches to the comb, wattles, lobes and legs. There are all kinds of preparations used to bring these " points " out effectively, but there is nothing better or easier to use than pure carbolated vaseline. After comb, wattles and lobes have been washed and dried, rub *very* little vaseline into the texture of the skin, and rub it good and hard. It will bring out the color in great shape. Shanks and toes, after being thoroughly brushed with soap and water, applied with a toothbrush, and dried, can be anointed the same way with vaseline. Fowls treated in this manner and placed in shipping coops that have muslin on the inner sides, plenty of coarse straw or shavings on the bottom, will arrive in the show-room in first-class order, and need little or no handling prior to the judging. With large fowl, such as

Brahmas and Cochins, which are slow in getting into condition, liberal feeding with sweet milk and raw, lean beef will accomplish wonders in making them grow and shine.

Buff color is the hardest to maintain to an even shade. The secret of getting even, rich, golden buff color is never to allow sun or rain to touch the surface of a showbird. One of the most successful exhibitors of buff fowl provides dense shade for his growing chicks, and when the latter attain their full plumage they are kept in a shed where sun and rain cannot enter to any great extent.

With parti-colored breeds the main thing is to have birds tamed and in high condition. Washing is not necessary where cleanliness and care are observed in housing the fowls. But in laced and barred varieties of fowl, it is necessary to pluck the old feathers and often some of the new and overlapping ones, from the back, wing-bows and breast, to bring out a better-laced or penciled effect. This is what might be called "grooming," and can hardly be classed under the much-discussed and abused term of "faking" as defined in the American Standard of Perfection.

Briefly speaking, the secret of conditioning fowls for exhibition is the specimen itself, thoroughly cleaned, trained and groomed by a careful, painstaking exhibitor.

Heimlich's Secret of Producing Successful Exhibition Fowls

D. T. Heimlich, one of the most popular poultry judges and exhibitors in the West, writes:

After ten years' experimenting to produce high-class exhibition stock, I learned that to get the best and most satisfactory results, the essential feature of success was *to have range* where a variety of food is supplied in the way of grass, slugs, bugs, grasshoppers; wheat, corn and oats fed just as they choose to help themselves—and when night comes every hen goes to roost with a full crop.

All during the summer and fall, up to the first day of December, these flocks of mine roost in a cedar hedge, and on plum and apple trees, and is the only shelter and roost they have for six or seven months of the year. After that they are driven in the hen house for a few evenings, which, by the way, is an open-front house.

Chicks soon after feathering form the habit of roosting on the cedar limbs, and this exposure to wind and weather seems to make them immune to colds, roup or diseases of any kind, and but few of them ever become lousy or scaly-legged. We raise from one hundred and twenty-five to two hundred annually under these

conditions, and in comparison with other flocks these gain from a half to a pound in weight over chicks raised under different methods of care and feeding.

When removed to the houses, those pullets intended as breeders are selected, banded and mated to two brothers as near alike in general character as can be selected from other matings of the same blood and breeding. Pullets as a rule are laying at six or seven months of age.

Hens with chicks are kept penned for two weeks, then given the range of the farm, and are fed twice daily on chick food, and in this way are constantly kept growing.

My method of winter feeding for fowls kept in runs is a mixture of two bushels of ground corn, two of ground oats, four of wheat bran, fifty pounds of beef scraps, twenty pounds of alfalfa, and twenty pounds of oil meal. This is fed in troughs, dry, where they can help themselves. In addition, twice daily, cracked corn and whole wheat is thrown to them in the scratching pens, which are littered with straw to the depth of about six inches. Grit, charcoal and pure water is placed so the fowls can have access to it at all times. For change of diet, sprouted oats, or oats soaked in water over night, is fed. The latter is especially resorted to when a poorly-formed shell appears among the eggs laid. Two or three days' feeding of oats will correct this trouble and bring about normally-formed eggs. Should this not entirely prevent soft or irregularly-formed eggs, then I drop a small lump of lime into the drinking water, and cut off the corn feeding in the litter.

I have also found that equal parts of the above ground mixture wet with soaked oats, is a mess that will be greedily eaten when fed two or three times a week, and gives the most satisfactory results for size, quality and abundance of eggs when wanted in winter and spring.

Zimmer's Secret of Line Breeding

F. B. Zimmer, one of the old-time poultry judges and poultrymen, says in mating and breeding for desirable qualities he has made rapid progress, and at the same time fully established his desires by choosing the most typical representative in the qualities desired. If a male, the first season he bred him to the best or strongest female having as many of the desirable qualities as possible to obtain. The next season this typical sire is bred to one or more of his own daughters that are strong in these qualities.

In one instance Mr. Zimmer bred a sire to his daughters, out of his daughter, for five generations. The sire was a typical Red Pyle Game bantam. The result of the mating was the most

beautiful and typical pullets in America, Mr. Zimmer never failing to secure first prize for pullets at the leading shows. He further says that the last chicks produced were just as hardy, just as good layers, and just as strong as the original pair.

Any quality—be it size, shape, color, comb, laying qualities, etc.—can be improved upon and made permanent, and in the shortest possible time, by this method. The mating can be a son on the perfect dam, or the perfect sire to his nearest perfect daughter. Mr. Zimmer does not call this method "in-breeding," but rather scientific line breeding.

Rigg's Secret of Uniformly-Marked Exhibition Stock

Thomas F. Rigg, who for more than thirty-six years has bred Standard-bred poultry, writes that in all that time he has not introduced one drop of new blood into the strain on the male side. By so doing, he reasons, he would by a single blow shatter the foundation which it took him years to obtain.

He introduces new blood by the purchase of a female. This female must be a hen and not a pullet. He says that no one, not even the most skilled and experienced fancier, can tell anything of the qualities of a pullet as a breeder. The pullet must be allowed to go through the second annual molt before one can determine its worth so far as plumage markings are concerned. *The new blood must be from known quality.*

This hen Mr. Rigg mates with a male of his own strain. The males from this mating are not used, but instead sent to the butcher, but the best pullet is kept until the spring of her second year before she is mated. She is then mated to one of Mr. Rigg's males—to her father, or to a son of her father.

In this way, every few years, a little new blood is injected into his strain without detracting from it. This new blood will carry him for several years.

Mr. Rigg further states that the introduction of a new male into a fancier's flock each year is ruinous. The two blood lines are fighting for supremacy. The conflict gives us all kinds of markings and practically no high-scoring, finely-marked specimens.

This line breeding of Standard-bred fowls is a plan that will insure success in both dollars and satisfaction.

Marshall's Secret of Training the Show Bird

F. J. Marshall, one of the leading poultry judges of the South, writes: After an experience of over a quarter of a century in the show-room, judging and exhibiting, I have come to the conclusion that the greatest secret of success in the show-

room, other things being equal, is the trained show bird. Nothing in my estimation goes so far toward showing all the good points a bird may possess as to have him so trained that the judge or his attendant may handle him with perfect ease. That he will stand in any position in which he may be placed, and is ever ready to pose as if for a picture.

A judge will give such a specimen every point he deserves, and the benefit of any doubts against him. In handling such birds the judge very naturally feels kindly toward them, and when you get the judge in his best mood you get the best he has to give.

A few spare moments a day devoted to handling and training show specimens will soon convince them that you are their friend and will do them no harm. Have a few fine morsels of meat, or something to tempt them, while handling them. This will put them in a good humor.

For increasing the weight of your show birds, after they have been shipped to the show-room, and perhaps lost quite a little in transit, nothing helps more, and is so safe to feed, as the regular cooked and seasoned bologna sausage. It is highly seasoned, and I do not know of a case of sickness attending its use, but, on the contrary, it usually produces the best of health.

Feed grain dry, what they will eat up clean, and then follow with the sausage and water, and you are ready for the weigher. Find out when the weighing is to be done, and have everything in readiness. Attend to these matters yourself, as no one else can or will.

Lambert's Secret of Growing Good Tails

Daniel J. Lambert, one of the best-known poultry judges and authorities in America, and teacher in the Rhode Island State College Poultry Department, gives a valuable secret for growers of exhibition poultry:

One of the secrets not generally known outside of professional poultry judges and experienced exhibitors is the necessity of show males possessing *good* tails. By good, I mean those in size, shape and color as described in the Standard and in perfect condition when the bird is shown. I have often advised prospective exhibitors on this point more than others because I knew that if the tail were full fledged, unbroken and clean the balance of the bird would usually be in the pink of condition.

Of course, abounding vitality is a paramount requisite, and a cock or cockerel lacking in vigor will show it quicker in the carriage of his tail than in color of comb or in any other way.

The most Standard-like tails are bred from ancestry possessing such themselves for at least two previous generations.

High tails, low tails, long tails, broad and pinched tails are usually the result of poor breeding, while wry and squirrel tails are often caused by roosting too close to the sides or top of building. A safe roost is at least eighteen inches from the walls and twenty-four from the rafters.

The time to show birds is when they are in their prime, neither immature or over ripe, as their tails are then all in and the proper length. This necessitates hatching at certain periods for particular shows and special preparation of cock birds to hasten or retard their molt. The growing cockerels must have plenty of room and a good range, with grass, shade, pure water and sound feed in abundance. A cock bird may be hurried with his molt by feeding a very narrow ration (one rich in protein and deficient in carbohydrates) or retarded by giving one weak in protein and rich in carbohydrates.

Lice, mites and nice show birds do not grow in the same coop. Vermin not only reduce the vitality of their victims, but injure the shape and lustre of their plumage. Prospective winners must be kept clean from the shell to the show-room; look carefully around the base of the tail of each bird for vermin. No oil or grease of any kind can be used on or around show birds, not even on their shanks, unless they are immediately wiped clean. It is easy to wash a bird nicely when you know how, but not so easy to get all of the soap out of their tail feathers without breaking the web or otherwise injuring the sickles. It is much better to keep them away from dirt and filth so that they will be clean and attractive at all times.

As the show season draws nigh, say six or eight weeks before the date of the exhibition, they should be examined and all broken feathers in wing or tail removed so as to allow time for new ones to grow in their place. When these are growing be careful to see that the main feathers are unobstructed and that the sickles curve nicely on the sides of the tail.

It is best to pen show males separately in a cage similar to an exhibition coop, for at least two weeks before the show, allowing them to exercise, alone, under cover on a clean straw-covered sand floor. For transportation to the show use shipping coops high enough (thirty inches) for the bird to stand up in and wide enough (sixteen inches) so that the largest males can turn around without breaking, bending or injuring that all-important tail.

Heck's Secret of Adding Exhibition Weight

Frank Heck, one of the best authorities in the West on exhibition poultry, gives here a secret that has never before been divulged:

Many a bird of superior merit fails to win because of the

severe cut for shortage of weight. Generally a pound or a pound and a half can be added to a bird by expert feeding. The special feeding should begin about four to six weeks before the fowl is to be shown, and it should be confined in a small pen or a big roomy coop. One feed each day is a mash, the greater portion of which consists of two or more of the following articles: boiled rice, boiled potatoes, corn meal, barley meal, buckwheat meal. Bran, wheat, middlings, ground oats, etc., may form a small percentage of the total bulk. Five per cent. of beef tallow, linseed meal or cotton seed meal is added. Mix the mash with whole or skim milk, the former preferred. Give sweetened water to drink. Two other feeds per day are given, consisting of corn, barley or buckwheat. An ample supply of grit is kept before the birds. With the variety of food here specified, the breeder can avoid feeding the same mash or the same whole grains two days in succession. The object should be not to cloy the appetite of the birds by continued feeding of the same rations. A good tonic or condition powder is valuable to counteract the ill effects of forcing, although some birds will not need it. The following is used by a number of experts, and has been until now a guarded secret: One ounce each of fenugreek, mandrake, ginger and gentian root, with four ounces of bicarbonate of soda; mix thoroughly and place one teaspoonful in each quart of mash food.

Fishel's Secret of Preparing Fowls for Early Fall Shows

U. R. Fishel, one of the most successful exhibitors in the West, gives this method of preparing fowls for early fall exhibitions:

The first two weeks of July we practically starve our breeders, getting them very thin in flesh. The last two weeks of July we feed heavy, starting slowly at first, but gradually increasing to heavy or full feed. By then we notice that the feathers are dropping, and the fowls are in full molt. We continue heavy feeding, using a mash three times a week, and by the first of September we have, in consequence, a lot of fine exhibition birds, all in full new plumage. Every now and then we go over the entire flock, plucking all broken tail and wing feathers, so that the new ones will come in even and proper. We never coop up a white fowl that we want to show at an early show, for they are apt to become creamy and their plumage does not ripen out properly. We have found this method a successful one, as our records for many years past will prove.

"Money-Making Secrets"

POULTRY SECRETS: See preceding pages.

HORSE SECRETS: Compiled and written by DR. A. S. ALEXANDER, of Wisconsin, the eminent veterinarian. Exposes the swindling methods of "gyps" and crooked dealers. Also many feeding and fattening secrets. Invaluable to horse buyers and owners. 64 pages, illustrated. 10th Edition, 95th thousand.

$100,000 PER YEAR FROM POULTRY: The story of the Curtiss Brothers and their Niagara Farm, built up from nothing to an annual business of $100,000 per year. Ducks, eggs, broilers, and clover are their staples. A remarkable story. 64 pages, illustrated. 3d Edition, 30th thousand.

GARDEN GOLD: A new booklet written for people with small gardens, showing how to raise your own vegetables in these days of high prices, and SAVE money. And how to MAKE money by selling your surplus. Splendid for people with back yards only. 64 pages, illustrated.

HALF A TON OF BUTTER PER COW PER YEAR: Nineteen cows in America have now reached this amazing record. PROF. VAN PELT, of Iowa, tells how it was done, how dairymen can largely increase their butter yield, and in many cases become record-breakers. 56 pages, illustrated.

SHALL I FARM For city people trying to decide whether or not to go to the country. No golden promises, but a clear, impartial, unbiased, unprejudiced weighing of the subject. All the advantages and disadvantages of all kinds of farming plainly set forth. Nothing like it ever before printed. 64 pages.

$6.41 PER HEN PER YEAR: Telling of the successful methods of the Cornings, whose system of production of high-grade sterile eggs for market revolutionized this branch of the poultry business. The original "Corning Egg-Book." 64 pages, illustrated. 14th Edition, 150th thousand.

DUCK DOLLARS There is money in ducks. The Weber Brothers market about 40,000 ducklings each year, and make a clear net profit of 50 cents on each one. This new booklet tells exactly how, with valuable advice to beginners as to operation and markets. 88 pages, illustrated.

FALL-BEARING STRAWBERRY SECRETS: This new fruit has now become standardized, and berries are to be bought in the markets from early May to late October. L. J. Farmer, one of the pioneers, tells all about the varieties, special care and methods needed, etc. The grower can hardly succeed without this booklet. 64 pages, illustrated.

EGG SECRETS: This booklet is especially designed for the many families who have room for only a few hens in a back yard or small pen, and who want their own supply of low-cost, high-quality eggs every day in the year. The only authoritative and up-to-date hand-book on this subject. 80 pages, profusely illustrated.

DRESSMAKING SELF-TAUGHT: A booklet which is a complete and practical course in dressmaking. Good dressmakers are rare and expensive; this booklet gives its owner the technical training which enables her to have her garments made as she wants them, when she wants them, at the lowest cost. 68 pages, 50 drawings and diagrams.

SQUAB SECRETS Squabs are money-makers, they are easy to raise, they command a fine market. But the owner must know how, or he will lose his investment, as many have done before him. In this splendid new booklet W. E. Rice gives just this information. He is a safe guide. 48 pages, profusely illustrated.

HOUSEHOLD SECRETS: The concentrated essence of all the housekeeping wisdom in the Farm Journal for 30 years. Brimming with new, useful, interesting, and reliable recipes, hints, methods, savings, short-cuts, and devices. The greatest book for the housekeeper, green or experienced, since our own "Handy Housekeeper." No home is complete without it. 128 pages, illustrated.

All of these booklets are similar to this. The price of each, to FARM JOURNAL subscribers only, is

25 cents, Postpaid

To others they are sold only with a subscription, $1.00 for any one of the booklets, postpaid, with four full years of the FARM JOURNAL. Address:

WILMER ATKINSON CO., Philadelphia, Penna.

FEB 19 1915